ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

in cotutela con UNIVERSIDAD DE GRANADA

DOTTORATO DI RICERCA IN

DIRITTO EUROPEO

Ciclo 37

Settore Concorsuale: 12/B1 - DIRITTO COMMERCIALE

Settore Scientifico Disciplinare: IUS/04 - DIRITTO COMMERCIALE

LEGAL STRUCTURE OF THE DIGITAL EURO

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Esame finale anno 2025

Alma Mater Studiorum · Università di Bologna

DOTTORATO DI RICERCA in DIRITTO EUROPEO

LEGAL STRUCTURE OF THE DIGITAL EURO

Thesis in

DIRITTO DELL'UNIONE EUROPEA

Tesi in co-tutela con l'Università di Granada, Spagna

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4 aprile 2025

Sometimes, I wrap my head around it all
And it makes perfect sense.

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Agradecimientos

Sin duda alguna, esta es la sección que más difícil me ha resultado completar de la tesis por el enorme esfuerzo de síntesis que requiere incluir a todas las personas que han contribuido en mi viaje académico desde 2020, cuando una enfermedad crónica y una oportunidad profesional otrora improbable me hicieron replantearme mi futuro profesional. 5 años que culminan en esta humilde obra y un proyecto vital que no acaba sino de empezar.

Mi primer pensamiento de gratitud no puede sino centrarse en mi esposa, la madre del que será nuestro primer descendiente, que, si todo va bien, estará con nosotros a finales de julio de 2025, David o Julieta. Rosie, las palabras que necesitaría para poder agradecerte tu incondicional apoyo no se han inventado aún. Si he podido, ha sido porque has estado a mi lado, *hasta en el fin del mundo*. Gracias por no perder la fe en mí, incluso cuando yo mismo parecía haberlo hecho.

Deseo recordar aquí a mi familia. Mis padres, Mati y José Antonio, y mis hermanos, Antonio y Rubén, han sido siempre un pilar esencial de mi vida y me esforzaré en tratar de igualar todo el cariño desinteresado que me han ofrecido siempre. También a mi abuelo, Antonio, cuyo apoyo me ha llevado siempre a perseguir mis sueños y no dejar de intentarlo jamás. Mis suegros, Miguel y Chari, que me han acogido como uno más desde el primer día y deseo que sepan que me van a tener a su entera disponibilidad de por vida. *Dana* y *Hatï* son familia también, por eso los incluyo entre mis allegados más queridos, deseando que fuesen inmortales y no me faltasen nunca. Por último, al resto de mi familia la recuerdo también con gran emoción, especialmente cuando pienso en los que ya no están con nosotros, pero que miran con orgullo desde allí donde se encuentren.

Tengo la enorme suerte de tener amigos inmejorables que han marcado mi vida de la mejor manera. Ignacio y Andy, mis padrinos de bodas, que me demuestran siempre con su amistad desinteresada que merece la pena vivir y disfrutar de la buena compañía.

También a Alberto, Jose y Juanjo, ellos me hicieron disfrutar de ir a una oficina cada día, tanto que, tras muchos años sin compartir empleador, podemos seguir estando muy presentes en las vidas de los otros. Ricardo y Adrien, hemos podido comprobar que no importa cuántos años pasen, ni cuántos kilómetros nos separen: estamos solo a una llamada de teléfono de distancia y, ahora, a un par de calles.

Mi carrera como investigador ha sido apoyada financieramente por dos instituciones, a las cuales también deseo agradecer expresamente su ayuda. Primero, a la Junta de Andalucía, por concederme en procedimiento competitivo un contrato pre-doctoral que me ha permitido sustentar a mi familia desde 2021 y concluir esta tesis doctoral. Segundo, a la Comisión Fulbright, por permitirme disfrutar de una experiencia sin igual en Nueva York. En particular, agradezco a Victoria, Linnea y Carinna su infinita paciencia y su inestimable ayuda para permitir que mi breve paso por Estados Unidos pudiera desarrollarse de manera exitosa.

Precisamente Nueva York y todas las personas que he conocido allí también deben estar presentes en estos agradecimientos. En particular, agradezco a *Fordham School of Law* su confianza en mi trabajo, espero que el *Cum Laude* obtenido en su programa ratificase que tomaron una decisión adecuada aceptándome. También deseo recordar a la *New York Public Library* y a la *Rose Main Reading Room* de la Quinta Avenida, pues esta tesis fue fraguada en extensas sesiones de trabajo en las que mirar sus frescos suponía sentirse abrazado por el cielo de casa, ese que los rascacielos no me permitían ver.

Agradezco, por supuesto, a la Universidad de Granada su apoyo institucional durante mi período como doctorando, pero deseo recordar a personas concretas. A Fernando, que me ha ayudado tanto desde el primer día que a menudo pienso que lo conozco de toda la vida. A Natalia, por enseñarme a ser un mejor investigador y ayudarme sin importar las consecuencias. A Javier, por su apoyo incondicional desde el Departamento de Derecho Mercantil y Romano. Y, por supuesto, a José Luis y a Andrés, por darme la oportunidad de iniciarme en el exigente mundo de la investigación y tratarme como un compañero más, en un mundo donde la jerarquía suele pesar mucho a los recién llegados.

Del mismo modo, agradezco a la Universidad de Bolonia y a los integrantes del Departamento de Sociología y Derecho de la Economía su ayuda durante estos últimos tres años. En particular, deseo agradecer a Francesca su labor como guía académica, colaboradora y confidente. Confío en que nuestros caminos seguirán coincidiendo en el

futuro, más si cabe cuando Sveva tenga compañía de juegos adicional pronto.

Al Real Colegio de España en Bolonia le debo principalmente dos cosas y deseo hacer explícito mi agradecimiento en esos términos. Primero, el haberme brindado una oportunidad inigualable para comenzar la internacionalización de mi carrera como investigador. Gracias por depositar tanta confianza en mí. Segundo, el haber podido conocer a personas magníficas que van a formar parte siempre de mis mejores recuerdos: Noelia, Patricia, Laura V., Laura N., Antonio, Higinio... De forma adicional, desearía reconocer la impecable labor de la Dott.ssa. Antonella Cacciari, puesto que los colegiales seríamos incapaces de concluir nuestro trabajo doctoral si no fuera por su inestimable ayuda.

Como no podría ser de otra forma, merecen un agradecimiento mis dos directores de tesis: Marco y Manolo. Trabajar conmigo a menudo es una actividad de riesgo, pero confío en haber satisfecho sus expectativas científicas con esta obra, la cual aspiro a continuar ampliando próximamente, integrando sus geniales consejos.

Por último, aunque resulte poco usual, deseo incluir un agradecimiento general al arte, en especial a la música. Como se puede deducir del texto de esta obra, mis cualidades artísticas no suponen mi mayor virtud, pero desde mi niñez he apreciado al artista y sus creaciones. Desde el comienzo de mi enfermedad, la música me ha ayudado a lidiar con mi dolencia crónica, uniéndose así a la lista de motivos por los que estoy agradecido por su existencia. Gracias a los artistas, aliviáis mi carga con vuestro talento.

Abstract

This thesis explores the comprehensive legal, technical, and regulatory aspects derived from the upcoming implementation and issuance of the digital euro, a central bank digital currency (CBDC) designed by the European Union. To achieve so, this study provides relevant context on the current legal scenario for digital payments, including the applicable law that needs to be considered, the emergence of new digital means of payment, and the opportunity for the issuance of a CBDC in the euro zone.

To achieve a holistic analysis on the legal structure of the digital euro, this thesis is structured into seven chapters, one for each of the relevant themes included in the Proposal for the establishment of the digital euro. Thus, key aspects such as the legal tender status of the digital euro, its interaction with euro banknotes and coins, as well as its validity as a means of payment within the European Union are addressed, intertwined with other related topics, such as its distribution, the technical features is set to offer, and the improvements in terms of privacy that the digital manifestation of the single currency is meant to bring to the citizenry of the European Union.

The conclusion of this thesis evaluates the prospected changes in the text of the Proposal, as identified in the previous chapters, as well as the recommendations of legal nature that have been provided through the analysis in the thesis. Finally, future lines of research are identified to complete the study of the legal implications of the issuance of the digital euro.

Sintesi

Questa tesi esplora gli aspetti giuridici, tecnici e normativi derivanti dall'imminente implementazione ed emissione dell'euro digitale, una moneta digitale della banca centrale (CBDC) progettata dall'Unione Europea. A tal fine, questo studio fornisce un contesto rilevante sull'attuale scenario legale dei pagamenti digitali, compresa la legge applicabile che deve essere presa in considerazione, l'emergere di nuovi mezzi di pagamento digitali e l'opportunità dell'emissione di un CBDC nell'eurozona.

Per ottenere un'analisi olistica della struttura giuridica dell'euro digitale, questa tesi è strutturata in sette capitoli, uno per ciascuno dei temi rilevanti inclusi nella Proposta per la creazione dell'euro digitale. Vengono così affrontati aspetti chiave come il corso legale dell'euro digitale, la sua interazione con le banconote e le monete in euro, nonché la sua validità come mezzo di pagamento all'interno dell'Unione europea, intrecciati con altri argomenti correlati, come la sua distribuzione, le caratteristiche tecniche che si propone di offrire e i miglioramenti in termini di privacy che la manifestazione digitale della moneta unica è destinata a portare ai cittadini dell'Unione europea.

La conclusione di questa tesi valuta le modifiche prospettate al testo della Proposta, come individuato nei capitoli precedenti, nonché le raccomandazioni di natura giuridica che sono state fornite attraverso l'analisi della tesi. Infine, vengono individuate le linee di ricerca future per completare lo studio delle implicazioni legali dell'emissione dell'euro digitale.

Resumen

Esta tesis explora los amplios aspectos legales, técnicos y regulatorios derivados de la próxima implantación y emisión del euro digital, una moneda digital de banco central (CBDC) diseñada por la Unión Europea. Para lograrlo, este estudio proporciona un contexto relevante sobre el escenario legal actual de los pagos digitales, incluyendo la legislación aplicable que debe tenerse en cuenta, la aparición de nuevos medios de pago digitales y la oportunidad de la emisión de una CBDC en la zona euro.

Para lograr un análisis holístico sobre la estructura jurídica del euro digital, esta tesis se estructura en siete capítulos, uno por cada uno de los temas relevantes incluidos en la Propuesta para el establecimiento del euro digital. Así, se abordan aspectos clave como el curso legal del euro digital, su interacción con los billetes y monedas en euros, así como su validez como medio de pago dentro de la Unión Europea, entrelazados con otros temas relacionados, como su distribución, las características técnicas que pretende ofrecer, y las mejoras en términos de privacidad que la manifestación digital de la moneda única pretende aportar a la ciudadanía de la Unión Europea.

La conclusión de esta tesis evalúa los cambios previstos en el texto de la Propuesta, identificados en los capítulos anteriores, así como las recomendaciones de carácter jurídico que se han aportado a través del análisis de la tesis. Por último, se identifican futuras líneas de investigación para completar el estudio de las implicaciones jurídicas de la emisión del euro digital.

Glossary

Application Programming Interface (API) [1] A set of rules or protocols that enables software applications to communicate with each other to exchange data, features, and functionality.

Basic digital euro payment services [2] Basic digital euro payment services for natural persons shall consist of:

– opening, holding, and closing of a digital euro payment account;

– consulting balances and transactions;

– non-automated funding and defunding from a non-digital euro payment account;

– funding and defunding from/into cash;

– initiation and reception of digital euro payment transactions by means of an electronic payment instrument, to the exclusion of conditional digital euro payment transactions other than standing orders, in the following use cases:

- person-to-person digital euro payment transactions;

- point-of-interaction digital euro payment transactions, including point-of-sale and e-commerce;

- government-to-person and person-to-government digital euro payment transactions.

– digital euro payment transactions referred to in Article 13(4); and

– provision of at least one electronic payment instrument for the execution of digital euro payment transactions as referred to in the previous points.

Bitcoin [3] [4] A decentralised crypto-asset and payment system launched in 2009 by its creator, the individual or group of individuals self-named “Satoshi Nakamoto”.

Blockchain [5] [6] A distributed ledger that stores an immutable history of past transactions, structured around blocks of data connected chronologically in a virtual chain.

Central Bank Digital Currency (CBDC) [7] [8] A form of digital money that is issued by a central bank. It is available under two different models, retail CBDC and wholesale

CBDC, depending on the authorised end user. It can also be defined as a digital payment instrument, denominated in the national unit of account, that is a direct liability of the central bank available for day-to-day payments.

Central bank money [9] Money issued by a public institution, namely a central bank, available for citizens in the form of banknotes and coins and for financial institutions in the form of central bank reserves.

Commercial bank money (CBM) [10] Money created by commercial banks by expanding their balance sheets. It is backed and balanced by the assets held by commercial banks.

Comparable means of payment [11] Digital means of payment, including debit card payment and instant payment at the point of interaction but excluding credit transfer and direct debit that are not initiated at the point of interaction.

Conditional digital euro payment transaction [12] A digital euro payment transaction which is instructed automatically upon fulfilment of pre-defined conditions agreed by the payer and by the payee.

Contractual term not individually negotiated [13] A term shall always be regarded as not individually negotiated where it has been drafted in advance and the consumer has therefore not been able to influence the substance of the term, particularly in the context of a pre-formulated standard contract. The fact that certain aspects of a term or one specific term have been individually negotiated shall not exclude this definition to the rest of the contract if an overall assessment of the contract indicates that it is nevertheless a pre-formulated standard contract. Where any seller or supplier claims that a standard term has been individually negotiated, the burden of proof in this respect shall be incumbent on him.

Credit institution [14] An undertaking the business of which is to take deposits or other repayable funds from the public and to grant credits for its own account.

Cross-border payment [15] An electronically processed payment transaction initiated by a payer, or by or through a payee, where the payer's payment service provider and the payee's payment service provider are located in different Member States.

Cross-currency payment [16] A transaction between the payer and payee that includes a currency conversion as part of the payments chain. This would serve, for instance, cases of retail international trade and remittances.

Crypto-asset [17] A digital representation of a value or of a right that is able to be transferred and stored electronically using distributed ledger technology or similar technology.

Digital euro holdings Holdings available for the digital euro user in her digital euro payment account.

Digital euro payment account number Unique identifier associated to a digital euro payment account.

Digital euro payment transaction [18] An act, initiated by a payer or on his or her behalf, or by the payee, of placing, transferring, or withdrawing digital euro, irrespective of any underlying obligations between the payer and the payee.

Digital euro settlement structure [19] The settlement infrastructure of the digital euro adopted by the Eurosystem, based on TARGET.

Distributed ledger technology (DLT) [20] A technology that enables the operation and use of distributed ledgers. 'Distributed ledger' means an information repository that keeps records of transactions and that is shared across, and synchronised between, a set of DLT network nodes using a consensus mechanism.

Electronic money [denominated in euro] [21] 'Electronic money' means electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions as defined in point 5 of Article 4 of Directive 2007/64/EC,[22] and which is accepted by a natural or legal person other than the electronic money issuer.

Enterprise [23] An enterprise is considered to be any entity engaged in an economic activity, irrespective of its legal form. This includes, in particular, self-employed persons and family businesses engaged in craft or other activities, and partnerships or associations regularly engaged in an economic activity.

Ethereum [24] A blockchain-based software platform that supports the Ether (ETH) crypto-asset.

European Digital Identity Wallets [25] A product and service that allows the user to store identity data, credentials, and attributes linked to her/his identity, to provide them to relying parties on request and to use them for authentication, online and offline, for a service in accordance with Article 6a of COM(2021) 281 final; and to create qualified electronic signatures and seals.

Eurosystem [26] Comprises the ECB and the national central banks of the Member States whose currency is the euro. It conducts the monetary policy of the European Union.

Fiduciary money [27] Refers to banknotes and coins. These means of payment are termed "fiduciary" because their value is based on the confidence and trust of the holder in the issuer of the currency; their intrinsic value is not guaranteed by a clause providing for an exchange at a fixed conversion factor against some other asset such as, for instance, gold.

Front-end service [28] [29] All components necessary to provide services to digital euro users that interact via defined interfaces with back-end solutions and other front-end services. It may be approximated to be the user interface that enables users to access all digital euro services as described in the Proposal.

Gatekeeper [30] An undertaking providing core platform services, designated pursuant to Article 3 of Regulation (EU) 2022/1925 (Digital Markets Act).

Instant payment [31] Credit transfers that make funds available in a payee's account within ten seconds of a payment order being made.

Inter-PSP fee Amount in the form of a fee to be paid among payment service providers (PSPs) when a digital euro payment transaction requires the intervention of two or more of them.

Internet protocol address-range (IP Address) [32] A unique address that identifies a device on the internet or a local network. IP stands for "Internet Protocol," which is the set of rules governing the format of data sent via the internet or local network.

Interoperable payment system [33] A payment infrastructure where different payment systems or payment service providers can seamlessly work together. This enables users of different payment services to conduct transactions with each other without friction. Interoperability in payment systems ensures that different networks, platforms, and technologies can communicate and operate in a way that provides a seamless payment experience across various financial institutions and service providers.

Local storage device Broad reference made in the Proposal to the ROM memory of a mobile device used for offline digital euro payment transactions, which require to be settled directly in said device, recording the transaction in its ROM memory.

Local storage device identifier Unique identifier used to differentiate local storage devices from each other. Differences exist to separate different digital euro users, but also different devices associated with a given digital euro user.

Merchant service charge [34] Fee paid by the payee, as long as she is a merchant, to a payment service provider when acquiring a digital euro payment transaction.

Microenterprise [35] An enterprise which employs fewer than 10 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 2 million.

Mobile device [36] A device that enables digital euro users to authorise digital euro payment transactions online or offline, including in particular smartphones, tablets, smart watches, and wearables of all kinds.

Non-fungible token (NFT) [37] A token that represents ownership over a unique item, like a concrete unit of currency that can only be used for a given transaction.

Non-profit legal entity [38] A legal entity which by its legal form is non-profit-making or which has a legal or statutory obligation not to distribute profits to its shareholders or individual members.

Offline digital euro payment transaction [39] A digital euro payment transaction, made in physical proximity, where authorisation and settlement take place in the local storage devices of both payer and payee.

Offline holding limit [40] Limit to the use as a store of value of the offline digital euro. It can be set manually by a digital euro user at any amount between zero and the holding limit set by the European Commission in accordance with Article 37, in connection with Article 39, point 2, of the Proposal on the establishment of the digital euro.

Offline population [41] Category equated to “unbanked” or “underbanked” population; population unable to access financial intermediation services.

Online digital euro payment transaction [42] A digital euro payment transaction where the settlement takes place in the digital euro settlement infrastructure.

Online holding limit [43] Limit to the use as a store of value of the online digital euro. It is defined as the difference between the overall holding limit determined by the European Central Bank minus the offline holding limit as defined by the digital euro user.

Open standard [44] A referential set of rules or procedures that is freely available for adoption, implementation and updates, and usable by anyone.

Original equipment manufacturer (OEM) [45] Most commonly refers to a company that designs or formulates a product and contracts a manufacturer (typically, a contract manufacturer or CM) to manufacture the product (typically called an OEM product), which the OEM then either brands as its own or incorporates into its own branded product. OEM nomenclature is confusing because parties sometimes use the term OEM to refer to the CM and because it is the CM, not the OEM, that is typically the OEM product’s "original manufacturer".

Overall holding limit [46] Limit to the use as a store of value of the digital euro that applies to both online and offline digital euro holdings. It is directly determined by the European Central Bank and acts as the reference value for both the online and offline holding limits.

Payment service provider [47] Credit institutions, electronic money institutions, post office giro institutions which are entitled under national law to provide payment services, payment institutions, the ECB and national central banks when not acting

in their capacity as monetary authority or other public authorities and Member States or their regional or local authorities when not acting in their capacity as public authorities. Additionally, natural or legal persons benefiting from an exemption pursuant to Article 32 or 33 PSD2 are also included in this definition.

Permissioned blockchain [48] A distributed ledger that is not publicly accessible. It can only be accessed by users with permission. The users can only perform specific actions granted to them by the ledger administrators and are required to identify themselves through certificates or other digital means.

Programmable money [49] Units of digital money with an intrinsic logic that limits each unit's full fungibility.

Providers of electronic communication services [50] Suppliers of electronic communications networks. "Electronic communications networks" must be understood as transmission systems, whether or not based on a permanent infrastructure or centralised administration capacity, and, where applicable, switching or routing equipment and other resources, including network elements which are not active, which permit the conveyance of signals by wire, radio, optical or other electromagnetic means, including satellite networks, fixed (circuit- and packet-switched, including internet) and mobile networks, electricity cable systems, to the extent that they are used for the purpose of transmitting signals, networks used for radio and television broadcasting, and cable television networks, irrespective of the type of information conveyed.

Providers of support services [51] One or more entities, appointed by the European Central Bank, that provide services to all payment service providers distributing the digital euro that are aimed at facilitating the smooth functioning of digital euro payment transactions.

Residence [52] The place where a natural person is legally resident in the Union as defined in Article 2, point (2), of Directive 2014/92/EU. Thus, 'legally resident in the Union' means where a natural person has the right to reside in a Member State by virtue of Union or national law, including consumers with no fixed address and persons seeking asylum under the Geneva Convention of 28 July 1951 Relating to the

Status of Refugees, the Protocol thereto of 31 January 1967 and other relevant international treaties.

Retail CBDC [53] A form of legal tender denominated in the national currency, serving as a medium of exchange, store of value, and unit of account, all while constituting a liability of the central bank and asset of the private sector, meaning individuals, households and businesses.

Reverse waterfall functionality [54] Digital euro functionality that allows users to make an online euro payment transaction where the transaction amount exceeds their digital euro holdings, using funds available in a non-digital euro payment account associated to their digital euro payment account.

Scriptural money [55] All money in book-entry form and therefore not circulating in the form of banknotes and coins.

Seigniorage [56] The interest earnt on the money lent, or the return received on the assets acquired, by the central bank. The word origins from "seigneur," the lord who had the right to mint coins in the past.

Single access point [57] A unified database concerning the personal data that is defined in point 4 of Annex IV to the Proposal. Said information shall be available at all times, being updated in real time by PSPs, and should be in possession of the European Central Bank to ensure both holding limits laid down in Article 16 and the emergency switching described in Article 31 can be guaranteed.

Smart contract [58] [59] A piece of code stored in a blockchain that can automatically execute transactions if certain conditions are met, without requiring the help of an intermediary company or entity. They are usually associated with the blockchain-based software platform Ethereum despite not being an exclusive manifestation of it.

Stablecoin [60] A crypto-asset that has a relatively stable exchange rate with major fiat currencies. A notable example is Tether (USDT), which usually trades at around $1.

Standing order [61] An instruction that a customer gives to her bank to pay somebody a fixed amount of money from her account on the same day periodically.

Switching [62] Upon a digital euro user's request, transferring from one payment service provider to another either the information about all or some digital euro payment services, including recurring payments, executed on a digital euro payment account, or the digital euro holdings from one digital euro payment account to the other, or both, with or without closing the former digital euro payment account, while maintaining the same account identifier.

Token [63] A virtual item tracked on a blockchain that represents the ownership of an asset, including a currency unit.

Transaction data [64] All available data concerning an offline digital euro transaction that could lead to effectively identifying who the parties intervening are and the amount associated with the transaction.

Transaction identifier [65] A unique identifier generated for any digital euro payment transaction that allows for its ulterior identification.

Unbanked/Underbanked population See Offline population; population unable to access financial intermediation services.

Unique digital euro account identifier [66] Unique identifier provided for any given digital euro payment account. The digital euro user may keep using the same identifier even in the event of changing the payment service provider used to access the digital euro payment services, as it is designed to be immutable.

User alias [67] A unique pseudonymous identifier used to protect a user's identity when processing digital euro payments that can only be attributable to an identifiable natural or legal person by the payment service provider distributing the digital euro or by the digital euro user.

User authentication [68] A procedure which allows the payment service provider to verify the identity of a payment service user or the validity of the use of a specific payment instrument, including the use of the user's personalised security credentials.

User identifier [69] A unique identifier created by a payment service provider distributing the digital euro that unambiguously differentiates, for online digital euro purposes,

digital euro users but that is not attributable to an identifiable natural or legal person by the European Central Bank and the national central banks.

Waterfall functionality [70] Digital euro functionality that allows users to have their digital euros in excess of any limitations the ECB may adopt in accordance with Article 16 ("Limits to the use of the digital euro as a store of value") of the Proposal automatically defunded to a non-digital euro payment account, where an online digital euro payment transaction is received.

Wholesale CBDC [71] A CBDC reserved for commercial banks and other institutions appointed by the central bank to facilitate payments, remittances, and even the settlement of other financial instruments.

Notes

[1] *What is an API?*, International Business Machines (IBM), retrieved from: https://www.ibm.com/topics/api. Last access on August 16, 2024.

[2] Annex II to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[3] *What is Bitcoin?*, CoinDesk, Retrieved from: https://www.coindesk.com/learn/what-is-bitcoin/. Last accessed on August 20, 2024.

[4] See Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system.

[5] See Mehta, N., Agashe, A., & Detroja, P. (2019). Blockchain, Bubble or Revolution?. P. 268.

[6] *What is blockchain technology?*, CoinDesk, Retrieved from: https://www.coindesk.com/learn/what-is-blockchain-technology/. Last accessed on August 20, 2024.

[7] EU Blockchain Observatory and Forum (2021). Central Bank Digital Currencies and a Euro for the Future, p. 7.

[8] See Bank for International Settlements (2020). Central bank digital currencies: foundational principles and core features – Report no 1 in a series of collaborations from a group of central banks. *BIS Papers*

[9] See *What is money: How is money created?*, EUROPEAN CENTRAL BANK – EUROSYSTEM, retrieved from: https://www.ecb.europa.eu/ecb-and-you/explainers/tell-me-more/html/what_is_money.en.html. Last access on August 16, 2024.

[10] See *Id.*

[11] Article 2(25) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[12] Article 2(17) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[13] Article 3, point 2, of Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts.

[14] Article 4(1), point (1), of Regulation (EU) No 575/2013 of the European Parliament and of the Council (Capital Requirements Regulation).

[15] Article 2(1) of REGULATION (EU) 2021/1230 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 July 2021 on cross-border payments in the Union.

[16] See note (72) of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).

[17] Article 3(5) of REGULATION (EU) 2023/1114 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 31 May 2023 on markets in crypto-assets (MiCA).

[18] Article 2(3) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[19] Article 2(19) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[20] Articles 3(1) and 3(2) of REGULATION (EU) 2023/1114 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 31 May 2023 on markets in crypto-assets (MiCA).

[21] Article 2, point 2, of Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions amending Directives 2005/60/EC and 2006/48/EC and repealing Directive 2000/46/EC.

[22] The text should reference Directive 2015/2366 (PSD2) as Directive 2007/64/EC (PSD1) was repealed.

[23] Article 1 of Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises.

[24] *What is Ethereum?*, CoinDesk. Retrieved from: https://www.coindesk.com/learn/what-is-ethereum/. Last accessed on August 20, 2024.

[25] Article 3(42) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) No 910/2014 as regards establishing a framework for a European Digital Identity.

[26] Article 282, point 1, of the Consolidated version of the Treaty on the Functioning of the European Union.

[27] See European Monetary Institute. (1995). *The Changeover to the Single Currency*, p. 44. European Monetary Institute.

[28] Article 2(20) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[29] Compiled by the author based on the review of Article 28 of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[30] Article 2(1) of the Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act).

[31] *What are instant payments?*, EUROPEAN CENTRAL BANK – EUROSYSTEM, retrieved from: https://www.ecb.europa.eu/paym/integration/retail/instant_payments/html/index.en.html. Last accessed on August 16, 2024.

[32] See *What is an IP Address – Definition and Explanation*, KASPERSKY. Available at: https://www.kaspersky.com/resource-center/definitions/what-is-an-ip-address. Last accessed on September 24, 2024.

[33] World Bank Group (2021). Interoperability in Fast Payment Systems. *World Bank Fast Payments Toolkit*.

[34] Article 2(24) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[35] Article 2 of Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises.

[36] Article 2(31) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[37] See Mehta, N., Agashe, A., & Detroja, P. (2019). Blockchain, Bubble or Revolution?. P. 285.

[38] Article 2(18) of Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013.

[39] Article 2(15) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[40] See Article 16, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. While no official definition has been provided, it can be inferred from the characteristics described in said article.

[41] See section 1.3 ("*Unbanked / underbanked / offline population*") of the *Study on New Digital Payment Methods*, EUROPEAN CENTRAL BANK – EUROSYSTEM. Available at: https://www.ecb.europa.eu/euro/digital_euro/timeline/profuse/shared/pdf/ecb.dedocs220330_report.en.pdf. Published in March 2022. Last accessed on September 20, 2024.

[42] Article 2(14) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[43] See Article 16, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. While no official definition has been provided, it can be inferred from the characteristics described in said article.

[44] *Open standards vs. open source: A basic explanation*, IBM, retrieved from: https://www.ibm.com/blog/open-standards-vs-open-source-explanation/. Last accessed on August 29, 2024.

[45] *Glossary – Original Equipment Manufacturer (OEM)*, THOMSON REUTERS PRACTICAL LAW, retrieved from: https://uk.practicallaw.thomsonreuters.com/5-592-7865?transitionType=Default&contextData=(sc.Default)&firstPage=true. Last accessed on August 30, 2024.

[46] See Article 16, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF

THE COUNCIL on the establishment of the digital euro. While no official definition has been provided, it can be inferred from the characteristics described in said article.

[47] Articles 1, point 1, 4(11), 32 and 33 of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market (PSD2), amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC.

[48] See *Permissioned Blockchain: Definition, Examples, vs. Permissionless*, INVESTOPEDIA, retrieved from: https://www.investopedia.com/terms/p/permissioned-blockchains.asp. Last accessed on September 11, 2024.

[49] Article 2(18) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[50] Article 2(1) of Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code.

[51] Article 2(30) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[52] Article 2(16) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[53]See above *Central Bank Digital Currency (CBDC)*

[54]Article 13, point 4, letter b), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[55]See Fiduciary money above.

[56] *What is seigniorage?*, EUROPEAN CENTRAL BANK – EUROSYSTEM, retrieved from: https://www.ecb.europa.eu/ecb-and-you/explainers/tell-me/html/seigniorage.en.html. Last accessed on August 16, 2024.

[57] See Article 35, point 8, and Annex IV ("*Personal data processed by the European Central Bank and national central banks*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[58] See Mehta, N., Agashe, A., & Detroja, P. (2019). Blockchain, Bubble or Revolution?. P. 290.

[59] *How do Ethereum smart contracts work?*, COINDESK. Retrieved from: https://www.coindesk.com/learn/how-do-ethereum-smart-contracts-work/. Last accessed on August 20, 2024.

[60] See Mehta, N., Agashe, A., & Detroja, P. (2019). Blockchain, Bubble or Revolution?. P. 291.

[61] *Standing order*, OXFORD LEARNER'S DICTIONARY, retrieved from: https://www.oxfordlearnersdictionaries.com/definition/english/standing-order?q=standing+order. Last accessed on August 26, 2024.

[62] Article 2(26) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[63] See Mehta, N., Agashe, A., & Detroja, P. (2019). Blockchain, Bubble or Revolution?. P. 292.

[64] The author has provided this definition as an abstraction of Article 37, point 2, of the Proposal.

[65]See *Id.*

[66]See *Account identifier* above.

[67] Article 2(28) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[68]Articles 4(29) of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market (PSD2), amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC.

[69] Article 2(27) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[70]Article 13, point 4, letter a), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

[71]See *Central Bank Digital Currency (CBDC)* above

Chapter 1

Introduction

Digital payments have become ubiquitous since 2020, with the Covid-19 outbreak in its first quarter, becoming the preferred means of payment for the youngest sector of the population in a scenario in which the use of physical banknotes and coins is slowly decaying. Regulatory authorities around the globe have witnessed the proliferation of a multitude of new means of payment which, while improving the quality of life for consumers for the most part, have raised new regulatory dilemmas that have required updating the existing legal framework for digital payments. Thus, with commercial banks becoming the leaders of this transition to digital means of payment, these authorities have found a new competitor in the appearance of crypto-assets, which not only threatens the monetary sovereignty of central banks, but also pose a danger for the stability of the financial system as a whole. The need for a public digital means of payment, capable of bringing the benefits of using commercial bank money to digital transactions, has been overwhelming, yet it has materialised in the design of central bank digital currencies, attracting the interest of most central banks in market economies.

In this context, the European Union authorities have been working on the implementation of the so-called digital euro for the past 5 years. Ever since the publication of the initial report addressing the possibilities of issuing the digital euro, the project for its implementation has progressed to become a reality in the form of a Proposal for a Regulation aimed at establishing the digital euro in the near future. Due to the novelty of its content, the legal analysis of this legislative proposal could benefit from a thorough and in-depth analysis of its scope, in order to properly understand the European legislator's attempts to implement a system of incentives that would invite the main participants in

the system, mainly consumers and payment service providers, to voluntarily adopt the new digital manifestation of the single currency in the European Union. In line with this objective, this study seeks to offer a careful analysis of the legal structure of the digital euro, introducing the most recent and relevant knowledge on the subject into the analysis, with a view to its full integration into the legal analysis of the Proposal provided by the legal academia.

This chapter is structured as follows: first, an overview of the legal context on digital payments in the European Union is provided. Second, the concept of central bank digital currency is addressed, introducing elements into the study that enable the categorisation of the different technologies and architectures that, broadly, exists, as well as the benefits associated with its implementation. Third, the digital euro is contextualised to enable its analysis in the next chapters of this Thesis. Finally, the main goal of this study is formulated and explained in depth, in connection with the methodology followed for the provision of this work.

1.1 Current legal context on digital payments: from PSD1 to MiCA

Directive 2007/64EC, commonly known as PSD1,[1] was firstly adopted in 2007 providing the legal foundation for a single market for digital payments, which enabled safer and more innovative payment services across the European Union.[2] The objective was to make cross-border payments as easy, efficient, and secure as national payments within a Member State.[3] The implementation of PSD1 meant to modernise the economy of the European Union, which was hindered at the time because of the lack of a common, harmonised, legal framework that could unify payment transactions.[4] Despite the previous existence

[1] Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC (First Payment Services Directive or PSD1.)

[2] See *Payment Services Directive: frequently asked questions*, EUROPEAN COMMISSION. Available at: https://ec.europa.eu/commission/presscorner/detail/fr/MEMO_15_5793. Last accessed on September 19, 2024.

[3] *Id*.

[4] See Recital (1) of Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC (First Payment Services Directive or PSD1.)

of European Union acts on the matter,[5] the measures taken before the implementation of PSD1 were not enough, recommending the establishment of a more modern and coherent legal framework for payment services within the European Union.[6] In this context, the adoption of PSD1 has meant more transparency and information for consumers, concerning execution time and fees, as well as improved the position of customers, who got their refund rights strengthened with a clarified revision of the expected liability of each intervening party.[7] In addition to that, the seed for instant payments in the European Union was initially considered in PSD1.[8]

However, after its entry into force in early 2008,[9] PSD1 started to become obsolete because of the thriving payments landscape it had helped developing in the first place. Thus, the European Commission proposed to revise the PSD1 in July 2013 as part of a new package of legislative measures on payment services, also including the Interchange Fee Regulation.[10] [11] The number of payment service providers (PSPs) in the European Union had incremented, as well as the number of services they were providing to users, requiring a revision of the unified legal framework on digital payment services within the European Union. With the arrival of 2015, Directive (EU) 2015/2366,[12] commonly known as PSD2, is born.

The European Union authorities were aware of the progress achieved in integrating retail payments within the Union thanks to PSD1,[13] yet they acknowledged that digital

[5] See, e.g., Directive 97/5/EC of the European Parliament and of the Council of 27 January 1997 on cross-border credit transfers, Regulation (EC) No 2560/2001 of the European Parliament and of the Council of 19 December 2001 on cross-border payments in euro, as well as Commission Recommendation 87/598/EEC of 8 December 1987 on a European Code of Conduct relating to electronic payment (relations between financial institutions, traders and service establishments, and consumers), Commission Recommendation 88/590/EEC of 17 November 1988 concerning payment systems, and in particular the relationship between cardholder and card issuer, or Commission Recommendation 97/489/EC of 30 July 1997 concerning transactions by electronic payment instruments and in particular the relationship between issuer and holder

[6] See Recital (3) of Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 on payment services in the internal market amending Directives 97/7/EC, 2002/65/EC, 2005/60/EC and 2006/48/EC and repealing Directive 97/5/EC (First Payment Services Directive or PSD1.)

[7] See Raya-Quero, D. (2020). La diligencia de los usuarios y el papel de la biometría en la Directiva (UE) 2015/2366. *Diario La Ley*, (9742).

[8] See *supra* note 4.

[9] PSD1 entered into force in January 2008, with a maximum date of transportation for Member States of November 2009.

[10] Regulation (EU) 2015/751 of the European Parliament and of the Council of 29 April 2015 on interchange fees for card-based payment transactions (Interchange Fee Regulation.)

[11] See *supra* note 4.

[12] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2.)

[13] See Recital (1) of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 Novem-

payments have benefited from technological progress since its adoption, in particular with the rapid growth in the number of electronic and mobile payments, challenging the existing, at the time, legal framework.[14] As significant areas of the retail payments market, in particular card, internet and mobile payments, remained fragmented along national borders within the European Union and many innovative payment products or services could not be regulated under PSD1,[15] PSD2 was designed to improve the quality of payment services by offering a stable legal framework with a desire of permanence, enabling the adoption of new payment technologies, not foreseen at the time because of the limitations of technology, improving those areas in which PSD1 had failed to anticipate new business models.[16] With a transposition that was partially postponed until 2020,[17] PSD2 entered into force reinforcing refund rights beyond what PSD1 did and introducing strong customer authentication (SCA) and the ability to benefit from biometric sensors as a valid method of that reinforced method of authentication.[18] [19]

Despite the success of PSD2 in its proposed objectives, transformative technologies have improved the financial sector in the recent years, enabling the appearance of financial assets that required specific regulation due to its growing popularity and high volatility,

ber 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2.)

[14] See Recital (3) of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2.)

[15] See Recital (4) of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2.)

[16] See Raya-Quero, D. (2020), *supra* note 7. See also subsection 5.3.1 "*European Digital Identity Wallets – Article 25 Proposal*" in Chapter 5 of the Thesis, for a discussion on the topic of the principle of technological neutrality that binds the legal acts emanating from the European Union authorities.

[17] See, e.g., *Everything you need to know about PSD2*, BBVA. Available at: https://www.bbva.com/en/economy-and-finance/everything-need-know-psd2/. Last accessed on September 19, 2024. The European Banking Association allowed Member States to transpose certain provisions of Directive 2015/2366 up to December 31, 2020, because of the negative impact it may had on e-commerce.

[18] See Article 4 ("*Definitions*"), point 30, ("*strong customer authentication*") of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2.) Factor "*inherence*", something the user is, enabled the use of biometric sensors, nowadays common in mobile devices, as an authentication method.

[19] A Third Payment Services Directive has been proposed by the European Commission. See the Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on payment services and electronic money services in the Internal Market amending Directive 98/26/EC and repealing Directives 2015/2366/EU and 2009/110/EC. COM/2023/366.

threatening both customers and the financial system as a whole. The emergence of crypto-assets[20] in the past five years pushed the European Union to provide a legislative response to their unregulated issuance, as PSD2 was not the appropriate legal act to address them.[21] The Regulation on Markets in Crypto-Assets, or MiCA,[22] entered into force in 2023 providing a harmonised legal framework in crypto-assets within the European Union, providing specific rules to protect consumers and the financial system while ensuring fair competition.[23]

The constant evolution that the digital payments market is subject to has led the European Union authorities to improve, once more, the existing legal framework. Facing the threat of losing monetary sovereignty to crypto-assets that may displace the use of the single currency in the European Union in e-commerce,[24] the European Commission put forward a legislative package to establish a framework for a digital euro while ensuring the legal tender status of physical euro banknotes and coins across the euro area, safeguarding the essential role of central bank money within the euro area.[25] Thus, the Proposal on the establishment of the digital euro[26] is aimed at providing natural and legal persons residing or established in a Member State whose currency is the euro[27] with digital euro payment services, enabling said users to access a public digital means of payment equivalent to euro banknotes and coins, being a direct liability of the European Central Bank.[28]

In order to understand the implications of the issuance of a digital euro it is necessary to address its technological category and its legal implications before analysing the

[20] See "*Crypto-asset*" in the *Glossary*.

[21] While some crypto-assets could be used as means of payment, their general design is closer to other financial assets such as securities, because of their capability of being traded because of its, apparent, inherent value.

[22] Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937 (Markets in Crypto-Assets or MiCA.)

[23] See Recital (6) of Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937 (Markets in Crypto-Assets or MiCA.)

[24] See Recital (7) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[25] See *Briefing – Digital euro package*, European Parliament. Available at: https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/751477/EPRS_BRI(2023)751477_EN.pdf. Published in September 2023. Last accessed on September 19, 2024.

[26] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Hereinafter in the chapter, "the Proposal."

[27] Access to and distribution of the digital euro is addressed in Chapter 4 ("*Distribution of the digital euro*") of the Thesis. Its content qualifies this assertion.

[28] See Recital (6) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

specifics of the Proposal. Thus, the concept of central bank digital currency (CBDC) is addressed in the next section, providing context on its origin, categorisation and the associated benefits of its issuance, as considered by the European Central Bank.

1.2 Central bank digital currencies

In the previous section, the implementation of central bank digital currencies (CBDCs)[29] has been suggested as a regulatory response to the increasing presence of digital payments. In this context, CBDCs have been described as the digital manifestation of central bank money,[30] issued by public institutions at the population's service in search of a new technology that may reduce the current dependency on private means of payment issued by commercial banks, whose interests may not be aligned with those of the citizens. While the concept of CBDC is rather homogenous among relevant authorities and the specific literature analysing this phenomenon, the functionalities that a central bank may implement in its CBDC are varied, recommending its separated analysis to ensure the concept is clear for an educated reader or legal connoisseur who is set to address a legal text concerning the lawful implementation of a CBDC.

The need for a CBDC has also been studied keenly by central banks and other relevant authorities, providing an ample enumeration of case uses that recommend the implementation of a CBDC. While not every beneficial scenario considered by those authorities can be of application to any country, reviewing the potential of this new technology of payments allows for an enriched analysis of the potential of CBDCs, especially before its implementation, when it is possible to request the regulator that additional characteristics may be considered based on its prospective utility or the successful application in other projects.

The inclusion of this section founds its rationale in providing context, in the terms described in the previous two paragraphs, to the implementation and issuance of the digital euro in the European Union. To ensure the analysis performed in the following chapters is aligned with the available literature on CBDCs, stemming from both relevant authors in the legal, economic, and technological fields, as well as from international monetary authorities, this chapter presents essential concepts and considerations on the

[29] See "*Central Bank Digital Currency (CBDC)*" in the *Glossary*.
[30] See "*Central bank money*" in the *Glossary*.

new digital manifestation of central bank money that is a CBDC.

To achieve this goal, this section is structured as follows: first, the concept of CBDC is analysed and an adequate description of the consequences of its issuance is provided. Second, a categorisation of CBDCs is offered, accompanied by a comparison of available CBDC architectures considering different technological approaches that are available for implementation. Additionally, several considerations on the possibilities that such technologies entail for the implementation of a CBDC are offered. Finally, a brief analysis of relevant cases of use for a CBDC is presented, based on the prior identification of useful scenarios by monetary authorities and the need for alternative solutions to the currently existing in the digital payments system landscape. After that, in the next section,[31] the digital euro as presented in the Proposal[32] is contextualised with respect to the content analysed in this chapter, laying the foundations for the legal analysis presented later in the Thesis.

1.2.1 The concept of CBDC

An initial review on the concept of central bank digital currency requires analysing descriptions provided at the dawn of its consideration by relevant authorities. Thus, a CBDC has been defined as a digital form of central bank money that is different from balances in traditional reserve or settlement accounts,[33] laying the foundations for considering the main innovation associated with its issuance in the availability of the CBDC for its use by the general public.[34] Yet, this definition does not capture the entirety of the concept of CBDC, as it can also be defined as a digital payment instrument, denominated in the national unit of account, that is a direct liability of the central bank available for day-to-day payments.[35] In short, this new digital manifestation of central bank money is aimed at providing the population a public alternative to the currently existing digital means of payment, enabling its benefits, namely legal tender[36] and financial stability, for

[31] See section 1.3 "*The digital euro*" in this Chapter.

[32] See *supra* note 26.

[33] See CPMI-MC (2018). Central bank digital currencies. Committee on Payments and Market Infrastructures, Markets Committee.

[34] See subsection 1.2.2.4 "*Wholesale or retail*" below. Traditionally, central bank money has only been available for wholesale operations. Only a retail CBDC can be considered as a real implementation of new payments technology.

[35] See Bank for International Settlements (2020). Central bank digital currencies: foundational principles and core features – Report no 1 in a series of collaborations from a group of central banks. *BIS Papers*.

[36] See section 2.3 "*Legal tender status of the digital euro – Article 7 Proposal*" in Chapter 2 of the Thesis.

the general public.

The suitability of CBDCs to provide an adequate response to the scenario described in the previous section for digital payments seems rather justified. Monetary sovereignty is at stake when it comes to digital payments, as banknotes and coins cannot be used for e-commerce, which has become predominant for large segments of the population ever since the outbreak of Covid-19 in 2020.[37] Payment service providers[38] are benefiting from its new status quo in which consumers are required to use their services for commerce and, despite the adequate limitations that the legal framework lays down on them,[39] they are free to impose their own interests, who might not be aligned with those of the population. In addition to that, the popularity of crypto-assets, somewhat more controlled nowadays,[40] has meant the emergence of a new competitor in the digital payments landscape, one which could permanently displace the usefulness of central bank money from the centre of the financial system.

In this context, several central banks around the globe have manifested their interest in issuing a CBDC. From around 40 monetary authorities consulted on 2018,[41] to nearly 80 in 2023,[42] on-going CBDC projects seem to have become a priority in the past years. In particular, 44 CBDC projects are currently in a pilot phase as of September 2024, with up to 59 still in a research or initial development phase.[43] However, despite the apparent

[37] See *How COVID-19 has permanently changed payment habits*, PAYSAFE. Retrieved from: https://www.paysafe.com/eu-en/resource-center/how-covid-19-has-permanently-changed-payment-habits/. Published on May 6, 2021. Last access on September 20, 2024.

[38] See Articles 1 ("*Subject matter*") and 2 ("*Scope*") of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2.) This categorisation is only of application for the European Union.

[39] See, e.g., Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2.) The European Union enabled a respectable legal framework for payment service providers, yet it might not be enough because of how much bargaining power they hold due to its beneficial situation.

[40] See *Interest over time – Bitcoin*, GOOGLE TRENDS. Available at: https://trends.google.com/trends/explore?date=today%205-y&q=bitcoin. Last accessed on September 20, 2024. The decaying interest in crypto-assets can be proxied via analysing the general interest for Bitcoin, arguably its most famous manifestation, using Google Trends. After an all-time high in mid 2021, the current interest in the crypto-asset is equivalent to that of September 2019.

[41] See Boar, C., Holden, H., & Wadsworth, A. (2020). Impending arrival–a sequel to the survey on central bank digital currency. *BIS paper*, (107).

[42] See Di Iorio, A., Kosse, A., & Mattei, I. (2024). Embracing diversity, advancing together-results of the 2023 BIS survey on central bank digital currencies and crypto.

[43] See *Central Bank Digital Currency Tracker*, ATLANTIC COUNCIL. Available at: https://www.

interest in the issuance of a CBDC, some central banks have expressed their concerns, neglecting its implementation[44] or delaying the project indefinitely.[45]

In any case, CBDC projects are not a homogenous category. Since the technology of payments to be implemented is variable, every project presents its particularities, requiring a general analysis of the different characteristics available to fully understand the implications of their issuance.

1.2.2 Categorisation of CBDC architectures

Despite alluding to a common technological category with a unified description, as addressed at the beginning of the previous subsection, CBDCs are variable when different projects are compared because of their inherent nature. Each country considering the issuance a CBDC faces a different context, which recommends the implementation of a public digital means of payment that adequately fits in it. Thus, a broad analysis of the essential technological differences that may appear when comparing CBDC projects improves the ability of the legal analyst to determine the most suitable legal framework that is required for the issuance of said CBDC.

For ease of scientific reference, a convention of technological differences in CBDCs that is generally accepted has been used in this subsection. In particular, the work of Auer & Böhme (2020),[46] [47] provides adequate theoretical background to ensure differentiation between CBDC around four essential technical characteristics: the nature of claims of a CBDC and the Central Bank role, the use of conventional or distributed ledger technologies (DLT) infrastructures for the settlement of payment transactions, whether the CBDC is account-based or token-based, and its consideration as wholesale or retail CBDC.

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atlanticcouncil.org/cbdctracker/. Updated monthly, last accessed on September 20, 2024.

[44] See subsection 5.3.6.2.1 "*Critique – Do we need a digital euro or just better settlement infrastructures?*" in Chapter 5 of the Thesis. Denmark and Czech Republic have decided not to continue their CBDC project claiming that their efforts must focus on improving the existing settlement infrastructures.

[45] For instance, the digital dollar project in the United States of America has not made any relevant update in the past two years, despite claims to still being on going.

[46] See Auer, R., & Böhme, R. (2020). The technology of retail central bank digital currency. *BIS Quarterly Review, March*: https://www.bis.org/publ/qtrpdf/r_qt2003j.pdf

[47] See also Auer, R., Cornelli, G., & Frost, J. (2020). Rise of the central bank digital currencies: drivers, approaches and technologies. *SSRN*: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3723552

1.2.2.1 The nature of claims of CBDC and the central bank role

The nature of claims refers to the guarantee associated with the funds. In this case, we differentiate direct claims and indirect claims. For the first category, funds become a direct liability on the central bank balance sheet, meaning that those funds are considered central bank money and they are backed by the monetary authority itself, being possible to consider them as risk-free. For its part, funds under the category of indirect claims are not a direct liability of the central bank, but of the financial intermediary who is in charge of its distribution, no matter its issuance has been required by the monetary authority. Consequently, indirect claims are not risk free, since the financial intermediary may be affected by specific issues for its business or systemic risk in the event of a financial crisis.

According to the taxonomy proposed by Auer and Böhme (2020),[48] a CBDC can be considered into three different categories considering the nature of its claims with respect to the central bank: indirect CBDC, direct CBDC, and hybrid CBDC. While intermediate configurations can be achieved, the authors adequately only consider these three categories to ensure clarity when addressing different types of CBDC.[49]

An indirect CBDC is also known as synthetic, two-tier, or multi-cell CBDC architectures. The CBDC is a claim on an intermediary. Intermediaries handle retail payments and are in charge of know-your-customer (KYC) actions, as they are the ones in contact with customers. In this architecture, the central Bank only handles wholesale payments. In this case, the proposed architecture for the CBDC is not that much different from the current landscape for digital payments, as users will still be accessing digital payments using a financial instrument that is handled by financial intermediaries. While the central bank could still be the one in charge of other design characteristics of the CBDC,[50] users will only be entitled to claim against the aforementioned intermediaries. Thus, despite its naming, the indirect architecture for a CBDC does not entail a real, novel, manifestation of a CBDC.

In the case of a direct CBDC, this architecture can be achieved in multiple ways, namely digital banknotes,[51] allowing final users to open banking accounts in the central

[48] See Auer, R., & Böhme, R. (2020), *supra* note 46.

[49] As described, all three categories can be qualified and infinite intermediate positions attending to the characteristics here analysed can be achieved.

[50] See the next subsections below.

[51] See *Hybrid Banknotes Can Bridge Cash and Crypto*, CoinDesk. Available at: https://www.coindesk.com/business/2021/05/12/hybrid-banknotes-can-bridge-cash-and-crypto/. Pub-

bank,[52] or via a crypto-asset issued by the central bank, yet governed by distributed ledger technologies.[53] In this case, the CBDC is a direct claim on the central bank but it is the central bank who also handles retail payments, although a certain level of implication of other financial intermediaries could be allowed under this architecture to ensure compliance with KYC regulation.[54] This architecture is revolutionary, as it would allow customers to access central bank money directly for the first time, contrary to the current state of the monetary policy of mostly all countries around the globe,[55] which disallows this. However, even in the event of allowing minimal intervention of adequate third parties to support the central bank in essential tasks as previously described,[56] there are obvious disadvantages that discourage opting for this architecture. Central banks are required to fulfil other functions[57] and they are not meant to act as financial intermediaries. Enabling this architecture would require central banks to incur in way too many tasks, which may impact their original functions.

Finally, a hybrid CBDC combines characteristics from the other two to achieve balance, becoming the obvious preferred option in terms of difficulty of implementation and legal implications for the central bank and the prospective users of the CBDC. Thus, in this architecture, the CBDC is a direct claim on the central bank's balance sheet, yet financial intermediaries are in charge of KYC measures and handling retail payments. The central bank supervises the system, provides support where needed,[58] and updates periodically the records and retail balances, which also brings useful information for monetary policy decisions.[59] [60] The most obvious disadvantage of this architecture is that central banks

lished on May 12, 2021. Last accessed on October 23, 2024.

[52] See Lastra, R.M. & Dietz, S. (2021). Central Bank Digital Currencies. *Journal of International Banking and Financial Law (UK)*. In the case of the European Union, this would be contrary to the Treaties, requiring changes in the applicable legal framework.

[53] See the next subsection.

[54] No central bank in the world is able to proceed with such a task because of operability. Collaborators are required to ensure that the basic control over the actions of customers accessing the CBDC services.

[55] See *supra* note 43. The Bahamas or the People's Republic of China could be considered two exceptions to this assertion considering the current state of development of their own CBDCs.

[56] See Raya-Quero, D. (2020), *supra* note 7.

[57] See, e.g., Article 127 of the Treaty on the Functioning of the European Union. The European Central bank must contribute to maintain price stability within the euro area.

[58] E.g., the central bank could be providing the settlement infrastructure for the CBDC payment transactions to take place. By doing this, the central bank is not directly in charge of payment transactions, but it can ensure that they occur as designed and all users experience the same experience, no matter which intermediary they are accessing the CBDC services with.

[59] Information on retail payments flows in real time to the central bank. Thus, decisions that may impact the money supply consider monetary aggregates in real time, rather than estimations based on past data. This enables the implementation of monetary policy measures that are more effective.

[60] As seen in Auer, R., & Böhme, R. (2020), *supra* note 46, the central bank does not access data in real

are required to rely on financial intermediaries to support most of the CBDC services, hence minimising the impact of the implementation of a CBDC in the financial system.[61]

1.2.2.2 Conventional or DLT infrastructure

The choice for a settlement infrastructure of the CBDC goes beyond the technology to be used, since it also impacts how users may access the CBDC services and the level of privacy that can be offered for the transactions. To ensure all concepts are addressed adequately, both alternatives will be analysed without considering its interaction with other characteristics being considered in this section.[62]

Central banks may opt for using conventional technology for the settlement of their CBDC transactions or they may choose implementing a DLT-based infrastructure. While the first option requires the least efforts, both from a technical and legal perspective, it also allows for the implementation of fewer improvements over the existing systems, since the technology employed has prioritised a stable system over distracting innovations.[63] An example of conventional settlement infrastructure could be the Trans-European Automated Real-time Gross Settlement Express Transfer system (TARGET.)[64] For its part, distributed ledger technologies (DLT)[65] have been developed in the past decades[66] to unlock the benefits that may come with decentralisation when applied to financial transactions. Its major downside is associated to the inability to process transactions massively, although

time. However, this consideration comes from the authors, as nothing should prevent central banks from accessing data concerning retail payments in real time or with minimal delay.

[61] *Ceteris paribus* the rest of the characteristics of a CBDC considered in this section, a hybrid CBDC makes the central bank rely on financial intermediaries with the distribution of the CBDC. Consequently, it must be designed to compete fairly with comparable private means of payment, requiring concessions to these intermediaries. In the end, users may not be able to perceive relevant changes when accessing those CBDC services when compared to other financial services offered by the financial intermediary.

[62] See Auer, R., & Böhme, R. (2020), *supra* note 46. Their analysis on CBDC settlement infrastructures includes references to indirect, direct and hybrid models, as described in the previous subsection. The analysis introduced in this subsection focus on the categories isolated, to ensure the concept can be captured without external references. But see subsection 1.2.2.5 "*A note on emerging technologies and CBDC*" below for an intertwined analysis of several of the characteristics of CBDCs being considered here.

[63] The conventional approach to settlement technology has focused on improving speed and safety in the transactions over other additions, who are the particular strength of alternative settlement infrastructures, as described later in this subsection.

[64] See the Guideline (EU) 2022/912 of the European Central Bank of 24 February 2022 on a new-generation Trans-European Automated Real-time Gross Settlement Express Transfer system (TARGET) and repealing Guideline ECB/2012/27 (ECB/2022/8).

[65] See "*Distributed ledger technology (DLT)*" in the *Glossary*.

[66] See Haber, S., & Stornetta, W. S. (1991). *How to time-stamp a digital document* (pp. 437-455). Springer Berlin Heidelberg. This is arguably the first technological process to benefit from decentralisation to verify transactions, nearly two decades before the publication of Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. *Satoshi Nakamoto*.

this technology is rapidly evolving to improve its efficiency.[67] An example of DLT-based settlement infrastructure could be Ethereum.[68]

Understanding the main differences between conventional and DLT-based alternatives for the settlement infrastructure of a CBDC requires considering how data is updated and stored in each model.[69] While conventional technologies centralise the storage[70] of the transaction data and its update is monopolised by the relevant authority involved, DLT-based alternatives rely on multiple participants of the settlement infrastructure to validate and update the transaction data. Since DLT settlement infrastructures require multiple participants to validate any transaction, in a process called "consensus mechanism," processing time is usually longer than in conventional systems.[71]

A notable example of a confirmed CBDC to be based in conventional settlement infrastructures is the digital euro.[72] The European Union may have led the way with its adoption, especially considering the reluctancy of relevant monetary authorities to the implementation of DLT systems,[73] especially when specific functionalities, such as offline payments, are tested under those new settlement infrastructures.[74] This has enabled the debate on whether the implementation of DLT settlement infrastructures is adequate for

[67] See, e.g., Liu, C., Muravskyi, V., & Wei, W. (2024). Evolution of blockchain accounting literature from the perspective of CiteSpace (2013–2023). *Heliyon*. The technical literature on the topic confirms the rapid evolution in terms of efficiency of blockchains, arguably the best known manifestation of DLT infrastructures.

[68] See "*Ethereum*" in the *Glossary*.

[69] See Auer, R., & Böhme, R. (2020), *supra* note 46.

[70] It must be said that centralising the data does not imply the existence of a unique datacentre, which would be hazardous from a resilience perspective because of its vulnerability. Centralising the data implies the concentration of data processing in a given authority, without allowing others to participate. While this ensures efficiency it may align the development of the settlement infrastructure to the interests of the responsible authority or deter technological progress because of the lack of competition.

[71] As stated in *supra* note 49, intermediate possibilities can be also considered for the settlement infrastructure. In particular, permissioned blockchains are addressed in subsection 5.3.6 "*Settlement of digital euro payment transactions – Article 30 Proposal*" in Chapter 5 of the Thesis. See also "*Permissioned blockchain*" in the *Glossary*.

[72] See *infra* note 89.

[73] See *The digital pound – speech by Jon Cunliffe, former Deputy Governor Financial Stability from 2013 to 2023*, Bank of England. Retrieved from: https://www.bankofengland.co.uk/speech/2023/february/jon-cunliffe-speech-at-uk-finance-update-on-central-bank-digital-currency. Published on February 7, 2023. Last accessed on September 17, 2024.

[74] See *E-krona pilot Phase 4*, Sveriges Riksbank. Retrieved from: https://www.riksbank.se/en-gb/press-and-published/notices-and-press-releases/notices/2024/the-e-krona-pilot-phase-4-offline-payments-with-e-krona/. Published on March 20, 2024. Last accessed on September 11, 2024. The Sveriges Riksbank -Sweden's central bank- has acknowledged the issues that may arise concerning the settlement of offline transactions using a DLT settlement infrastructure, namely limitations on the number of consecutive offline transactions that any user can perform and possible duplication of funds threats.

CBDC services, along with criticism on whether CBDCs are needed at all.[75]

1.2.2.3 Account-based or token-based

Providing access to the CBDC services is another relevant question concerning the selection of an architecture, as it impacts the level of privacy offered to the prospective users of the CBDC.[76] In this case, the opposing alternatives considered are CBDCs who are account-based and those who are token-based.

For account-based CBDCs, the ownership of funds[77] is tied to identity, with claims being represented in a database, akin to a classic bank account.[78] This model provides the authorities with relevant information of origin of funds and transaction data, in line with anti-money laundering (AML) and combating the financing of terrorism (CFT) requirements in most countries nowadays.[79] The obvious counterpart is materialised in terms of privacy: the CBDC is less similar to banknotes and coins, and starts being monitored just like commercial bank money.[80] Consequently, authorities benefit from better information to prevent undesired financial behaviour but prospective users are reluctant to using the CBDC, as they fear being controlled in their transactions.[81]

For its part, in token-based CBDCs ownership is not based on identify, but in the knowledge of an encrypted value.[82] Thus, funds in a token-based CBDC may be used by any individual aware of the code which enables concerns with respect to AML/CFT measures as well as the destruction or inability to use funds should the user forget the encrypted value.[83] While this system ensures the maximum level of privacy to users,

[75] See subsection 5.3.6.2.1 "*Critique – Do we need a digital euro or just better settlement infrastructures?*" in Chapter 5 of the Thesis.

[76] See Auer, R., & Böhme, R. (2020), *supra* note 46.

[77] In account-based models for a CBDC, funds are fungible by definition and no other consideration affects or qualifies them. They are represented in the selected unit of account with no differentiation between them.

[78] See *Id*.

[79] See section 6.7 "*Anti-Money Laundering – Chapter IX – Article 37 Proposal*" in Chapter 6 of the Thesis for an analysis of AML/CFT measures concerning the implementation of the digital euro.

[80] See subsection 1.3.2 "*Initial concerns of the population*" below. In the European Union, privacy and cash-like functionalities are essential for the population to accept the implementation of the digital euro.

[81] This is also an issue that enables financial exclusion, as citizens may avoid using digital funds in the form of commercial bank money to prevent authorities from controlling their actions, no matter their association with money laundering or other unlawful behaviour. An overly-controlling may disincentivise users to benefit from its use.

[82] See Auer, R., & Böhme, R. (2020), *supra* note 46

[83] See *Man has two guesses to unlock bitcoin worth $240m*, BBC. Accessed at: https://www.bbc.com/news/technology-55645408. Published on January 13, 2021. Last accessed on September 17, 2024. Token-based systems may cause losses associated with this scenario, which is quite usual nowadays.

as previously described, it may cause an additional issue: since funds are restricted by encryption, funds may become non-fungible increasing the difficulty to use the CBDC as a means of payment, which seems essential for its implementation.[84] On the other hand, the token-based approach would enable the implementation of new technologies to every day payment transactions, such as programmable money[85] and smart contracts,[86] which are valuable additions to a CBDC, yet clash with the conventional approach followed in an account-based CBDC.[87]

Despite its benefits, it is hard to imagine the implementation of a token-based CBDC in most Western countries because of the existence of restrictive AML/CFT legal frameworks.[88] In addition to that, the implementation of a token-based CBDC may clash with other essential requirements for the validity of the legal tender status of said CBDC. Thus, the European Central Bank stated that enabling programmable money, defined in a similar fashion to the approach to be followed in a token-based CBDC, would inevitably prevent the digital euro from accomplishing its legal tender status because of the lack of full convertibility for the funds considered.[89] However, the European Central Bank has tested token-based technologies in the past[90] and the language in the Proposal may indicate that the aforementioned asseveration could not be that strict.[91]

[84] See section 3.3 "*The use of the digital euro as a means of payment - Articles 15 and 17 Proposal*" in Chapter 3 of the Thesis.

[85] See "*Programmable money*" in the *Glossary*.

[86] See "*Smart contract*" in the *Glossary*.

[87] See subsection 5.2.4 "*Conditional digital euro transactions vs. Programmable money – Article 24 Proposal*" in Chapter 5 of the Thesis. In the specific case of the digital euro, the European legislator addresses the interesting benefits of programmable money, yet it excludes its application. However, it enables conditional payments that provide a similar result using an account-based CBDC, albeit in a more limited form.

[88] See Bofinger, P., & Haas, T. (2020). *CBDC: A systemic perspective* (No. 101). WEP-Würzburg Economic Papers.

[89] See point 14.1 of the of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). According to the monetary authority, "*the existence of any limitation on where, when or who payment users can pay using the digital euro would render it tantamount to a voucher. This would be inconsistent with its legal tender status, in particular, its acceptance at full face value, and would mean that it would be fungible neither with other units of digital euro, nor with euro banknotes and coins at par.*"

[90] See *Nota informativa sobre el lanzamiento de una convocatoria para solicitor propuestas de colaboración con el Banco de España con el objeto de realizar un programa de experimentación relativo a la utilización de tokens digitales para la liquidación de operaciones de pago y de valores mayoristas*, Banco de España – Eurosistema. Available at: https://www.bde.es/f/webbde/GAP/Secciones/SalaPrensa/NotasInformativas/Briefing_notes/es/notabe051222.pdf. Published on December 5, 2022. Last accessed on October 23, 2024.

[91] See Recital (64) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. The European legislator refers to the instantaneous settlement of offline digital euro payment transactions "*irrespective of whether digital euros are recorded as holding balances or units of value, or of the technology used. The digital euro settlement infrastructure should seek to ensure adaptation to new technologies, including distributed ledger technology*."

1.2.2.4 Wholesale or retail

The final characteristic considered for CBDC architectures refers to the end user of the system: a wholesale CBDC[92] only allows certain financial institutions appointed by the central bank to facilitate payments, remittances, as well as the settlement of other financial instruments, while a retail CBDC[93] enables individuals, households and businesses to access its services. Due to the simplicity of its concept, this category is typically used to define CBDC projects.[94]

It could be argued, however, that only retail CBDCs can be considered new technology, as the essence of a wholesale CBDC has been available for decades now.[95] Unless a wholesale CBDC is set to be issued on a DLT-based settlement infrastructure,[96] the issuance of said category by a central bank is likely to be considered redundant. Thus, despite its analysis is required conceptually, it should be limited to understanding the category, relying on the analysis to retail CBDCs who constitute progress in the digital payment system landscape.

1.2.2.5 A note on emerging technologies and CBDC

Despite the utility that arises from analysing all the previous categories, not all of them can be combined in a feasible or useful manifestation of a CBDC. In fact, some of the combinations would not even be considered as new payment technology at all, as previously considered. This subsection addresses certain particularities surrounding the adoption of specific technologies, such as DLT settlement infrastructures, providing notes on what must be revised in the existing legal framework, broadly considered.

[92] See "*Wholesale CBDC*" in the *Glossary*.

[93] See "*Retail CBDC*" in the *Glossary*.

[94] See, e.g., *Today's Central Bank Digital Currencies Status*, CBDC Tracker. Available at: https://cbdctracker.org. Last accessed on September 17, 2024.

[95] See Annex 3 ("*Wholesale application of a distributed infrastructure*") to the *Report on a digital euro*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf. Published in October 2020. Last accessed on September 16, 2024.

[96] See *Digital Dollar Project and DTCC: Security Settlement Pilot*, The Digital Dollar Project. Available at: https://www.dtcc.com/-/media/Files/Downloads/WhitePapers/DDP-DTCC-Pilot-Report.pdf. Published in November 2022. Last accessed on September 17, 2024. See also *Second group of participants chosen to test DLT for settlement in central bank money*, European Central Bank – Eurosystem. Retrieved from: https://www.ecb.europa.eu/press/intro/news/html/ecb.mipnews240621.en.html. Published on June 21, 2024. Last accessed on September 17, 2024. Both examples constitute existing tests being conducted to validate the use of DLT settlement infrastructures for wholesale CBDC purposes.

As anticipated in previous subsections,[97] certain characteristics of CBDC are likely to be implemented together. For instance, a retail CBDC aimed at becoming token-based would either require a DLT settlement infrastructure or implementing substantial changes in the currently existing conventional infrastructures.[98] In any case, the existing legal framework should be updated, either to ensure general acceptability of DLT systems or to enable new functionalities in the current technology under regulation. Similarly, an account-based CBDC meant to benefit from the implementation of a DLT settlement infrastructure should enable a revision of the legal acts governing the settlement of payment transactions to accommodate the new technology or opt in for an intermediate solution, such as a permissioned blockchain.[99] Even the alternative requires new regulation, as it would be needed to address which financial intermediaries are set to be included in the system, for how long, and the periodicity of affiliation, if needed.

Considering that updating the legal framework becomes a must, should the monetary authority of a given country decide to implement a DLT settlement infrastructure, intertwined solutions may ease the regulator. Thus, an integrated model[100] enables the possibility to implement both an account-based and a token-based CBDC that interact when needed, bringing the benefits associated to distributed ledger technologies, namely smart contracts, to a conventional settlement infrastructure.

1.2.3 Benefits and cases of use for a CBDC

As previously stated at the beginning of this chapter, central bank digital currencies have been seen as the best possible solution to guarantee the population access to a digital means of payment without relying, at least partially,[101] on the interests of private commercial banks, likely misaligned with those of the general public. However, in order

[97] See *supra* note 62.

[98] But see subsection 5.2.4 "*Conditional digital euro transactions vs. Programmable money – Article 24 Proposal*" in Chapter 5 of the Thesis. The European legislator has included in the Proposal an alternative that enables conditional payments in the conventional settlement infrastructure.

[99] See *supra* note 71.

[100] See section 2.2, figure 2, in *Mercati, infrastruttura, sistemi di pagamento – A digital euro: a contribution to the discussion of technical design choices*, Banca d'Italia - Eurosistema. Available at: https://www.bancaditalia.it/pubblicazioni/mercati-infrastrutture-e-sistemi-di-pagamento/questioni-istituzionali/2021-010/N.10-MISP.pdf?language_id=1. Published on July 2021. Last accessed on September 20, 2024.

[101] As discussed previously in this Chapter, it is sensible to consider that most central banks would rely on a hybrid model that relies on the intervention of financial intermediaries, hence the qualification included here.

to understand the utility of a CBDC, it is recommended to analyse specific cases of use to reference how digital payments can benefit from its implementation, especially considering that criticism has arisen recently regarding its expected utility.[102] In addition to that, it is worth mentioning that the availability of multiple architectures for a CBDC, as addressed in the previous section of this chapter, forecasts the existence of different cases of use that the digital manifestation of central bank money can be useful for. Consequently, the utility derived from each category must be considered to assess the impact of its implementation, improving the currently existing technology for digital payments.

Thus, considering benefits associated to improving payment efficiency and security, the implementation of CBDC can contribute to create digital payment systems that are more efficient, resilient,[103] and secure for all the actors involved, irrespective of the infrastructure selected for it.[104] In addition to that, lower costs and the increase of efficiency of the banking system may promote bank competition,[105] improving the quality of service for users.[106] Similarly, the improvement on security with the implementation of CBDCs improves the trust on digital payments[107] and attracts the implementation of novel technologies in the retail payments system.[108] Cross-border and cross-currency payments can also benefit from the issuance of a CBDC, as the current interoperable systems are privately-owned.[109] Finally, offline transactions under a CBDC regime would improve the

[102] See subsections 4.3.2.2 "*Critique – Is the digital euro equivalent to a public bank account?*" in Chapter 4 and 5.3.6.2.1 "*Critique – Do we need a digital euro or just better settlement infrastructures?*" in Chapter 5 of the Thesis.

[103] See the COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN CENTRAL BANK, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS The European economic and financial system: fostering openness, strength and resilience. COM/2021/32 final. Resilience in the financial system is a quintessential objective for the European Union. Ever since the outbreak of the pandemic of Covid-19 in 2020, the European Union has focused on implementing measures to improve the resilience of its Member States in times of distress. The financial system has been objective of such measures in an attempt to prevent financial crises or, at least, minimise the impact of those in the citizens of the European Union.

[104] EU Blockchain Observatory and Forum (2021). Central Bank Digital Currencies and a Euro for the Future. Electronic copy available at: https://ssrn.com/abstract=3891861.

[105] See Náñez Alonso, S. L., Jorge-Vazquez, J., & Reier Forradellas, R. F. (2021). Central banks digital currency: Detection of optimal countries for the implementation of a CBDC and the implication for payment industry open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(1), 72.

[106] See Ozili, P. K. (2023). Central bank digital currency research around the World: a review of literature. *Journal of Money Laundering Control*, *26*(2), 215-226.

[107] See Náñez Alonso, S. L., Jorge-Vazquez, J., & Reier Forradellas, R. F. (2021), *supra* note 105

[108] Sethaput, V., & Innet, S. (2023). Blockchain application for central bank digital currencies (CBDC). *Cluster Computing*, *26*(4), 2183-2197. This assertion considers the implementation of a CBDC based in a DLT settlement infrastructure, but it may be accepted for conventional technologies too.

[109] See section 4.5 "*Cross-currency payments – Article 21 Proposal*" in Chapter 4 of the Thesis.

current standard for debit and credit cards.[110] [111]

For its part, the issuance of a CBDC may improve the adoption of financial and digital inclusion measures, particularly in scenarios where cash usage declines.[112] Access to financial services for the unbanked population may improve because of the implementation of a CBDC, accessible anywhere using an internet connection,[113] when designed to complement physical banknotes and coins.[114] Although possible characteristics of a CBDC, such as interest-bearing capabilities, may contribute to financial inclusion, they are highly contended in the literature and by monetary authorities, recommending its further analysis.[115] Finally, some authors have claimed that Universal access is easier to obtain with DLT-based infrastructures and token-based architectures.[116]

Finally, the impact of the implementation of a CBDC is considered much positive for the monetary policy of the issuing country, as it provides new monetary policy tools for central banks while ensures the financial sovereignty of the currency. First, a CBDC would enable the availability of macroeconomic information in real time for the central bank,[117] even allowing unprecedented decisions of monetary policy such as the unconventional

[110] See Chu, Y., Lee, J., Kim, S., Kim, H., Yoon, Y., & Chung, H. (2022). Review of Offline Payment Function of CBDC Considering Security Requirements. Applied Sciences, 12(9), 4488. Offline digital transactions currently rely on being settled once any of the participants in a transaction, either the payer or the payee, are back online. The consequences of this system include duplicate payments and transactions that are later cancelled because of insufficiency of funds, causing distress to the recipient of the payment, who will be facing the negative consequences.

[111] See, e.g., *Press Release - Justice Department Sues Visa for Monopolizing Debit Markets*, Department of Justice of the United States of America. Available at: https://www.justice.gov/opa/pr/justice-department-sues-visa-monopolizing-debit-markets. Published on September 24, 2024. Last accessed on October 23, 2024. Reducing the dependence on card scheme owners is likely to benefit the financial system as a whole, preventing monopolistic conducts by some of the most relevant parties involved, such as Visa.

[112] See subsections 4.3.3 "*Digital and financial inclusion – Article 14(4) and 14(5) Proposal*" in Chapter 4 and 5.3.9.1 "*Critique – The technological progress paradox*" in Chapter 5 of the Thesis.

[113] See Tan, B. J. (2024). Central bank digital currency and financial inclusion. *Journal of Macroeconomics*, *81*, 103620. This paper models how the implementation of a CBDC improves banking access even for those who suffer financial inclusion for lacking enough resources.

[114] See A digital euro: widely available and easy to use - Introductory statement by Fabio Panetta, Member of the Executive Board of the ECB, at the Committee on Economic and Monetary Affairs of the European Parliament, European Central Bank – Eurosystem. Retrieved from: https://www.ecb.europa.eu/press/key/date/2023/html/ecb.sp230424_1~f44c7ac164.en.html. Published on April 24, 2023. Last access on September 20, 2024.

[115] See subsection 3.2.3.3 "*The digital euro shall not bear interest – Article 16(8) Proposal*" in Chapter 3 of the Thesis.

[116] See Auer, R., & Böhme, R. (2020), *supra* note 46.

[117] See Diez de los Rios, A., & Zhu, Y. (2020). *CBDC and monetary sovereignty* (No. 2020-5). Bank of Canada. But see Auer, R., & Böhme, R. (2020), *supra* note 46. Given design choices for the implementation of a CBDC may limit the ability of the central bank to analyse macroeconomic concerning the money offer arising from the use of the CBDC.

helicopter money,[118] in scenarios of decaying use of physical banknotes and coins.[119] Second, the appearance of private digital currencies[120] may be the end of monetary sovereignty.[121] Finally, stability of the financial system as a whole can also be considered to benefit from the issuance of a CBDC,[122] as it reduces the dependency over privately owned commercial banks.[123]

1.3 The European Union's approach to CBDC: The digital euro

The possibilities surrounding the creation of a central bank digital currency in the European Union started being reviewed by the European Central Bank and the Eurosystem before the beginning of this decade, with the monetary authority of the euro zone publishing an initial report in October 2020 to address the issuance of the so-called digital euro. Ever since the publication of that report, the digital euro project has progressed, materialising in June 2023 in the Proposal on the establishment of the digital euro.[124] Several design aspects of the digital euro, as presented in the Proposal, find its rationale in the research phase that has taken place in the period in between the aforementioned

[118] See Friedman, M. (1969). *The optimum quantity of money and other essays*. Aldine De Gruyter. Friedman proposed an extreme example that ignored the existing transmission mechanism of the monetary policy suggesting that the central bank should directly add funds to the citizens, *as if dropped from a helicopter overnight*. This reference is meant to illustrate that directly adding funds to the citizenry is possible via a CBDC, yet its macroeconomic implications need to be studied to guarantee its utility.

[119] See Náñez Alonso, S. L., Jorge-Vazquez, J., & Reier Forradellas, R. F. (2021), *supra* note 105.

[120] A notable example is Project Libra/Diem, a stablecoin funded by Meta Platforms, Inc. (formerly Facebook, Inc.) The first stages of its development caught the eye of monetary authorities because of the threat over monetary sovereignty, as the Meta Group market capitalisation is greater than most Member States of the European Union. The project was later abandoned by Meta Platforms, Inc., yet regulators are aware of the risks they face.

[121] Private actors, namely payment service providers in the terms of PSD2, have become the ultimate owners of financial transactions depending on digital funding. Cash is slowly decreasing its usage and, with it, the monopoly on money that central banks have held for the past centuries. While it could be argued whether money is a public good, central banks, through monetary policy, have controlled the money supply providing stability to the financial system. However, commercial bank money is not strictly under the control of monetary authorities.

[122] See *A well-designed digital euro would avoid risks for financial stability and banks' profitability*, European Commission. Retrieved from: https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/well-designed-digital-euro-would-avoid-risks-financial-stability-and-banks-profitabilit en?pk_source=website&pk_medium=link&pk_campaign=digital_euro_jrc. Published on June 28, 2023. Last accessed on September 20. 2024.

[123] See Sethaput, V., & Innet, S. (2023), *supra* note 108. This assertion must be qualified considering the CBDC architecture selected, as dependency on commercial banks can still be required for its issuance and distribution.

[124] See *supra* note 26.

dates. Consequently, analysing said process of research allows to qualify and understand the content of the Proposal, enriching its legal analysis.

With that objective in mind, this section is structured as follows: first, the initial considerations concerning the issuance of the digital euro are addressed. Second, the concerns and attitudes of the European Union citizens towards the implementation of the digital euro are considered. Third, the different stages of research and development that the digital euro has been through are briefly studied. Finally, the Proposal on the establishment of the digital euro is introduced, justifying the final design choices made and presenting a structural analysis of the legislative act.

1.3.1 Early conceptualisation

Considering the context described in the previous sections of this chapter, the European Central Bank decided in late 2020 to explicitly address its intentions to design and issue a central bank digital currency in the euro zone.[125] Thus, the Report on a digital euro,[126] published by the monetary authority of the European Union in October 2020, addressed the concept, necessity, implications, and potential implementation strategies for a CBDC known as the digital euro. The Report included the first envisage of the Union authorities on the digital euro that was finally introduced in the Proposal for the establishment of the digital euro in June 2023,[127] with notable absences in the characteristics initially described, evidencing that the initial roadmap has been updated through time to bring a final design that is more aligned with the citizens' opinion.[128]

The motivation for a digital euro in the European Union was outlined by the European Central Bank in the Report, focusing on the evolving digital economy and the increasing needs of digital means of payment in the rise of digitalisation in financial transactions

[125] But see *The new frontier of payments and market infrastructure: on cryptos, cyber and CCPs*, EUROPEAN CENTRAL BANK – EUROSYSTEM. Available at: https://www.ecb.europa.eu/press/key/date/2018/html/ecb.sp181115.en.html. Published on November 15, 2018. Last accessed on September 20, 2024. This constitutes the first official reference to the possibility of issuing a CBDC in the European Union.

[126] See *Report on a digital euro*, EUROPEAN CENTRAL BANK – EUROSYSTEM. Available at: https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf. Published in October 2020. Last accessed on September 16, 2024. Hereinafter referred to as "the Report."

[127] See *supra* note 26.

[128] See, e.g., Recital (1) of the Proposal on the establishment of the digital euro. While the European legislator affirms that the digital euro was originally envisioned as a retail CBDC, the content of the Report does not confirm this characteristic, with specific analysis of a wholesale variant of the digital euro that has been neglected in the final Proposal. Citizens' opinion on the issuance of the digital euro is addressed in the next subsection.

and the declining use of cash, consequence of the pandemic of Covid-19.[129] Thus, the monetary authority highlights the importance of issuing a CBDC to complement the role of central bank money in its physical form, namely banknotes and coins, enabling the population to access digital payments with a public alternative whose incentives are not governed by commercial considerations.

As initially described in the Report,[130] the digital euro was guaranteed to introduce several advantages in the digital payments system, promoting financial inclusion for the unbanked population, as well as accessibility features for those in need of digital inclusion,[131] and supporting the European Central Bank's monetary policy transmission. The digital euro was referenced to provide a secure, cost-effective alternative to cash and commercial bank money, offering consumers a reliable digital means of payment that is backed by the central bank, yet involves relevant private parties in its development to ensure technological progress is not hampered.[132]

The Report included a general analysis of the implied requirements for the issuance of the digital euro and the characteristics that it must met in order to contribute to the objectives briefly described in the previous paragraph.[133] In particular, the Report considered user needs and preferences, such as ease of use and accessibility with interoperability being essential, privacy and data protection, introducing the tension between traceability and the desire for anonymisation, as well as security in the transactions. In any case, the description of needs and cases of use was broad on purpose, as many design choices were still unclear at the time.

The legal basis for the issuance of the digital euro was also addressed in the Report, although scarcely.[134] The legal basis for the issuance of the physical euro was introduced as

[129] See section 2 ("*Reasons to issue a digital euro – possible scenarios and implied requirements*") of the *Report on a digital euro*, European Central Bank – Eurosystem. Available at:https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf. Published in October 2020. Last accessed on September 16, 2024.

[130] See *Id*.

[131] See subsections 4.3.3 "*Digital and financial inclusion – Article 14(4) and 14(5) Proposal*" in Chapter 4 and 5.3.9.1 "*Critique – The technological progress paradox*" in Chapter 5 of the Thesis. Both sections offer an analysis on the features included in the Proposal to ensure both financial and digital inclusion.

[132] See section 3 ("*Potential effects of a digital euro and implied requirements*") of the *Report on a digital euro*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf. Published in October 2020. Last accessed on September 16, 2024.

[133] See *Id*.

[134] See section 5 ("*Legal considerations regarding a digital euro*") of the *Report on a digital euro*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf. Published in October 2020. Last accessed on

a common enabling provision, ensuring the competence of the European Union authorities for this task. However, since the architecture design of the digital euro was still not final,[135] the legal analysis included in the Report was broad on purpose, enabling the academia to come up with all kinds of legal analyses on the topic in the following years.[136]

1.3.2 Initial concerns of the population

Following the release of the Report in late 2020, the Eurosystem published the results of the public consultation on the issuance of the digital euro in April 2021.[137] Said public consultation was launched on October 12, 2020 and ran until January 12, 2021, including 18 questions aimed at collecting the views of both citizens and professionals on the possible issuance of a CBDC in the euro zone, serving as an important input for the European Union authorities on whether authorising the implementation of the digital euro and which specific design choices were required.[138]

As considered by the results published in the Report on the public consultation, several topics topped the initial concerns of the European Citizens that participated in the survey. First, the key feature that the digital euro must offer was privacy in payment transactions.[139] Since the digital euro was envisioned to act as digital manifestation of euro banknotes and coins, users demanded anonymity in the transactions, or the closest characteristic available. Otherwise, they lacked an obvious incentive to switch from other digital means of payment issued by private actors.[140] Second, security in the transactions, as well as ease of usability, were described as important characteristics, focusing on the needs of prospective users of the digital euro who lack digital skills.[141] Finally, the rest of

September 16, 2024.

[135] See *Id.* The Report explicitly references the possibility of distributing *"a bearer digital euro (also referred to as "token-based,)"* not in line with the final design choices made in the Proposal.

[136] Such analyses were usually rendered futile with the publishing of the Proposal on the establishment of the digital euro, as some design considerations were finally dismissed by the European Commission.

[137] See *Eurosystem report on the public consultation on a digital euro*, EUROPEAN CENTRAL BANK – EUROSYSTEM. Available at: https://www.ecb.europa.eu/pub/pdf/other/Eurosystem_report_on_the_public_consultation_on_a_digital_euro~539fa8cd8d.en.pdf. Published in April 2021. Last accessed on September 20, 2024. Hereinafter, "the Report on the public consultation."

[138] See *Id.*

[139] See section 2 ("*Questions on the user perspective*") of the *Eurosystem report on the public consultation on a digital euro*, EUROPEAN CENTRAL BANK – EUROSYSTEM. Available at: https://www.ecb.europa.eu/pub/pdf/other/Eurosystem_report_on_the_public_consultation_on_a_digital_euro~539fa8cd8d.en.pdf. Published in April 2021. Last accessed on September 20, 2024.

[140] See *Id.*

[141] See *Id.*

the characteristics considered the most important were cost, to ensure that the digital euro could be free for natural persons, interoperability with the already existing digital payments landscape, and financial inclusion of the underbanked population.[142]

The Report on the public consultation also provided relevant information concerning the final design of the digital euro, as anti-money laundering (AML) and combating the financing of terrorism (CFT) measures were directly addressed,[143] as well as limits on the digital euro as an investment.[144] Respondents had the opportunity to materialise their concerns regarding these limitations, reinstating their preference for a digital euro with cash-like functionalities, cost-effective when compared with other existing payment methods, and easy to access and use, even if that would mean having to sustain certain limitations.[145]

1.3.3 Stages of development

After the publication of the Report on the public consultation, the Eurosystem confirmed the official launch of the digital euro project in July 2021.[146] The first stage, the investigation phase, was initially considered to last 24 months while the European Central Bank focused on the users' preferences towards the final design of the digital manifestation of the single currency.[147] This phase was characterised by the publication by the European Central Bank of a report on new trends in digital payments in March 2022,[148] and four reports on the progress made in the investigation phase: two in 2022, in September[149]

[142] See *Id*.

[143] See section 3 ("Questions on financial, payment and technology professionals' perspective") of the Eurosystem report on the public consultation on a digital euro, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/pub/pdf/other/Eurosystem_report_on_the_public_consultation_on_a_digital_euro~539fa8cd8d.en.pdf. Published in April 2021. Last accessed on September 20, 2024.

[144] See *Id*. The Proposal addresses such limitations as "*limits on the use of the digital euro as a store of value*" in its Chapter V ("*Use of the digital euro as a store of value and as a means of payment.*")

[145] See *supra* note 139.

[146] See *Eurosystem launches digital euro project*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210714~d99198ea23.en.html. Published in July 14, 2021. Last accessed on September 20, 2024.

[147] See *Id*.

[148] See *Study on New Digital Payment Methods*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/euro/digital_euro/timeline/profuse/shared/pdf/ecb.dedocs220330_report.en.pdf. Published in March 2022. Last accessed on September 20, 2024.

[149] See *Progress on the investigation phase of a digital euro*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/euro/digital_euro/progress/shared/pdf/ecb.degov220929.en.pdf. Published in September 2022. Last accessed on September 20, 2024.

and December,[150] and two in 2023, in April[151] and July.[152] These reports evidenced the interest of the European Union in analysing all relevant characteristics of the prospective CBDC to be implemented in the euro area, envisioning the introduction of a proposal to establish the digital euro.[153] In addition to that, in November 2022, the European Central Bank organised, jointly with the European Commission, a digital euro conference titled "*Towards a legislative framework for a digital euro*". This conference enabled policymakers and relevant stakeholders to discuss key regulatory aspects of a digital euro.[154] Finally, as a conclusion of the investigation phase, a summary was published in October 2023,[155] gathering all the relevant notions already presented in the previous four, in line with the content of the recently introduced Proposal on the establishment of the digital euro.

1.3.4 Proposal for a Regulation of the European Parliament and of the Council on the establishment of the digital euro

On June 28, 2023, the European Commission unveiled the Proposal on the establishment of the digital euro[156] as part of the legislative package to establish a framework for a digital euro while ensuring the legal tender status of physical euro banknotes and coins across the euro area, safeguarding the essential role of central bank money within the euro area.[157] The final design considered for the digital euro addressed the concerns

[150] See *Progress on the investigation phase of a digital euro – second report*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/euro/digital_euro/progress/shared/pdf/ecb.degov221221_Progress.en.pdf. Published in December 2022. Last accessed on September 20, 2024.

[151] See *Progress on the investigation phase of a digital euro – third report*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/euro/digital_euro/progress/shared/pdf/ecb.degov230424_progress.en.pdf. Published in April 2023. Last accessed on September 20, 2024.

[152] See *Progress on the investigation phase of a digital euro – fourth report*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/euro/digital_euro/progress/shared/pdf/ecb.degov230713-fourth-progress-report-digital-euro-investigation-phase.en.pdf. Published in April 2023. Last accessed on September 20, 2024.

[153] See *supra* note 146. The Proposal was originally expected for the first quarter of 2023.

[154] See *Towards a legislative framework for a digital euro*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/press/conferences/html/20221107_joint_ECB_EUC_conference.en.html. Published on November 7, 2022. Last accessed on September 20, 2024.

[155] See *A stocktake on the digital euro – Summary report on the investigation phase and outlook on the next phase*. European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/euro/digital_euro/timeline/profuse/shared/pdf/ecb.dedocs231018.en.pdf. Published on October 18, 2023. Last accessed on September 20, 2024.

[156] See *supra* note 26.

[157] See *supra* note 25.

of the population as noted in the Report on the public consultation from 2021, while supporting its choices on the four report on the investigation phase from 2022 and 2023.

With the publication of the Proposal, the final design of the digital euro can be addressed and analysed from a legal perspective, enabling the study of its provisions to determine whether the concerns of the population have been effectively mitigated. In order to do so, the architecture and main characteristics of the digital euro as a CBDC are addressed in the next subsection, with a brief description of the structure of the Proposal in the subsequent subsection. Thus, the analysis of the Proposal in this Thesis can be adequately performed in its legal context concerning the technology employed for the issuance of the digital euro and the legal act that authorises it.

1.3.4.1 Why a digital euro in the form described in the Proposal

The digital euro is a central bank digital currency aimed at providing a free and public digital means of payment to the residents of the euro area in line with the needs and concerns of the European Union population as manifested in the Report on the public consultation back in 2021. As described in the Proposal, the digital euro has been designed to work as a hybrid, account-based, retail CBDC that runs in a conventional settlement infrastructure based in TARGET Instant Payment Settlement (TIPS) technology. This means that the digital euro is aimed at providing some of the benefits associated with the implementation of a central bank digital currency, namely reducing the dependency of the population in private means of payment, while ensuring that payment service providers are still the centre of every transaction, as they have been included as essential intermediaries, processing every digital euro payment transaction, despite the digital manifestation of the single currency being a direct claim over the European Central Bank, who does not process transactions. In short, compared to comparable digital means of payment provided by private actors, the digital euro ensures mandatory acceptance,[158] improved privacy,[159] and a risk-free financial instrument that is provided at no cost for natural persons.[160]

However, despite the best efforts of the authorities involved in its development, citizens in the European Union are still reluctant to the implementation of the digital euro. Recent

[158] See section 2.4 "*Limitations to the principle of mandatory acceptance*" in Chapter 2 of the Thesis.
[159] See Chapter 6 ("*Privacy, data protection and AML/CFT requirements*") of the Thesis.
[160] See subsection 3.3.3 "*Free for natural persons on basic digital euro payment services - Article 17(1) and Annex II Proposal*" in Chapter 3 of the Thesis.

surveys have shown a reduction in the percentage of citizens willing to use the digital euro to complement the already existing means of payment, especially after the publication of the Proposal.[161] [162] The rejection of the digital euro evidences the need for a thorough revision of the Proposal considering improvements adequately in line with the preference of its prospective users.

1.3.4.2 Structural analysis of the Proposal

The Proposal for the establishment of the digital euro[163], as it was first published on June 28, 2023, includes 85 recitals, 42 articles, and 5 annexes, with the articles being structured in ten chapters. In addition to that, an explanatory memorandum[164] accompanies the Proposal, as it is usual, providing relevant information on certain design choices made for the digital euro. A brief description of the structure of the Proposal, as described, is addressed below.

Concerning the legal content of the Proposal, Chapter I,[165] titled "Subject matter and definitions," includes Articles 1 and 2, addressing the content announced in its title as expected. Said Chapter lays down the scope and content of the Proposal, while ensuring an adequate definition of the relevant categories considered in its provisions. For its part, Chapter II,[166] titled "Establishment and issuance of the digital euro," includes Articles 3 to 6 and references the nature of the digital euro as the digital form of the single currency in the euro zone, the authority of the European Central Bank to issue it, and the applicable

[161] See *Digital Euro Has Germans Fretting Their Money Won't Be Secure*, Bloomberg. Available at: https://www.bloomberg.com/news/articles/2024-08-17/digital-euro-has-germans-fretting-their-money-won-t-be-secure?embedded-checkout=true. Published on August 17, 2024. Last accessed on September 20, 2024. German citizens were more worried about the issuance of the digital euro in 2023, after the publishing of the Proposal, than what they were in 2022.

[162] See *Estudio sobre hábitos en el uso del efectivo*, Banco de España – Eurosistema. Available at: https://www.bde.es/f/webbe/INF/MenuVertical/BilletesYMonedas/Estudios_e_informes/Estudio_sobre_habitos_efectivo/Informe_Ejecutivo_Habitos_uso_efectivo_2023.pdf. Published on October 2023. Last accessed on September 20, 2024. 58% of surveyed Spanish citizens were reluctant to use the digital euro in 2022. In 2023, after the publishing of the Proposal, this percentage had grown to 65%.

[163] See *supra* note 26.

[164] See the Explanatory Memorandum that accompanies the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[165] See Chapter I ("*Subject matter and definitions*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[166] See Chapter II ("*Establishment and issuance of the digital euro*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

law and competent authorities involved in the establishment and subsequent control of the digital euro. These two first chapters set the basic legal framework of application, in addition to the Proposal itself, for the issuance of the digital euro.

Chapter III[167] of the Proposal, titled "Legal tender," includes Articles 7 to 12. This chapter analysis the legal tender status of the digital euro, once issued, and the limitations, whether territorial, based on personal considerations of the payer and payee, or based on monetary law nature, of the principle of mandatory acceptance for the digital manifestation of the euro. In addition to that, the interaction between the digital euro and its physical counterpart is addressed, ensuring its convertibility with euro banknotes and coins at par.

Further in the Proposal, Chapter IV,[168] titled "Distribution," includes Articles 13 and 14. This chapter determines the initial conditions for the distribution of the digital euro within the euro zone and sets up relevant considerations for accessing the digital euro services, such as the requirement for certain payment service providers, namely credit institutions, to provide for free the basic digital euro payment services as considered later in the Proposal.

For its part, Chapter V[169] of the Proposal, titled "Use of the digital euro as a store of value and as a means of payment," includes Articles 15 to 17. While the first of those articles sets out basic principles that enable the use of the digital euro as a store of value and as a means of payment, the other two include limitations that restrict each of the characteristics, respectively, while enabling adequate systems of control to ensure the digital euro is easily accessible by prospective users and it is not disadvantaged by payment service providers in favour of privately-owned comparable means of payment.

Chapter VI of the Proposal,[170] titled "Distribution of the digital euro outside the euro area," includes Articles 18 to 21. In a similar fashion to Chapter IV of the Proposal, the European legislator has addressed in here the conditions for the distribution of the digital

[167] See Chapter III ("*Legal tender*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[168] See Chapter IV ("*Distribution*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[169] See Chapter V ("*Use of the digital euro as a store of value and as a means of payment*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[170] See Chapter VI ("*Distribution of the digital euro outside the euro area*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

euro, considering this time the requirements for the authorisation of said distribution in Member States whose currency is not the euro, third countries outside the European Union, as well as the special consideration regarding third countries under a monetary agreement with the Union. Finally, the possibility of enabling cross-currency payments with Member States whose currency is not the euro is addressed, although only as a conditional action of the monetary authorities involved that would take place after the digital euro is issued.

Chapter VII[171] of the Proposal, titled "Technical features," presents a different structure, containing two different sections. Its first section, titled "Digital euro functionalities," includes Articles 22 to 24 and references characteristics of the digital euro such as accessibility and use, online and offline modalities of the digital euro and the possibility of implementing conditional digital euro payment transactions. For its part, the second section, titled "Modalities of distribution," includes Articles 25 to 33 and addresses technical considerations on the issuance of the digital euro, such as front-end services to access and use the digital euro, expected interoperability, dispute mechanisms and fraud prevention, compliance with sanctions emanating from the European Union, emergency switching from one payment service provider to another, and digital inclusion of prospective digital euro users.

Chapter VIII[172] of the Proposal, titled "Privacy and data protection," includes Articles 34 to 36. This chapter addresses the lawful purposes for which payment service providers, the European Central Bank and the national central banks, and the providers of support services may process data with respect to digital euro payment transactions, limiting the types of personal data they are able to gather and process. Intimately associated with the topic of privacy, Chapter IX[173] of the Proposal, titled "Anti-money laundering," only includes Article 37, in which the European legislator addresses the AML/CFT measures that apply specifically to offline digital euro payment transactions.

Finally, Chapter X[174] of the Proposal, titled "Final provisions," includes Articles 38

[171] See Chapter VII ("*Technical features*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[172] See Chapter VIII ("*Privacy and data protection*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[173] See Chapter IX ("*Anti-money laundering*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[174] See Chapter X ("*Final provisions*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

to 42, and it addresses relevant procedures in connection with other provisions in the Proposal, such as the power to adopt delegated acts of the European Commission, the mandate to the European Central Bank to provide reports on the adoption and use of the digital euro once it is first issued and the entry into force of the Regulation once it is no longer a Proposal.

In addition to that, the Proposal includes 5 different annexes that complement the content of the 10 aforementioned chapters. Thus, Annex I[175] to the Proposal, titled "Digital euro payment services," includes an enumeration of what the digital euro services consist in, in an open list that may be updated in the future. Annex II[176] to the Proposal, titled "Basic digital euro payment services," includes an open list, again, of basic digital euro payment services that must be provided for free to natural persons residing or established in the euro area by credit institutions. Lastly, Annexes III[177], IV[178], and V[179] to the Proposal, titled "Personal data processed by payment service providers," "Personal data processed by the European Central Bank and national central banks," and "Personal data processed by providers of support services," respectively, delimit the processing of personal data by each of the different controllers of the data considered.

1.4 Goal of this thesis

Having carefully addressed the existing context of the digital payments landscape and the specific necessity for the implementation of a central bank digital currency, the digital euro, in the European Union, the goal of this study must be presented. Considering the above, the main objective of this thesis is to adequately provide a review of the legal structure of the upcoming digital euro, focusing on those aspects that arise the most

[175] See Annex I ("*Digital euro payment services*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[176] See Annex II ("*Basic digital euro payment services*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[177] See Annex III ("*Personal data processed by payment service providers*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[178] See Annex IV ("*Personal data processed by the European Central Bank and national central banks*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[179] See Annex V ("*Personal data processed by providers of support services*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

doctrinal complexity for the legal academia and the European legislator. To do so, a profound analysis of the Proposal on the establishment of the digital euro is presented in the chapters to come in this work.

It is of paramount importance to provide the European Union authorities with sufficient doctrinal analysis of all relevant aspects that Proposal entails with respect to the final design of the digital euro. In its current phase of implementation, the digital euro can still be improved and have its design adapted to implement changes as needed, especially after having the legal academia identifying relevant flaws in its current formulation as presented in the Proposal. The European legislator is currently analysing the body of legal analysis currently being published to understand what changes are required and the rationale behind them. The right time to propose an integrative study is now, while changes are still possible.

As briefly introduced in the previous paragraph, the legal academia around the globe has shown a high interest for the topics of central bank digital currencies, in general, and the digital euro, in particular. This new digital manifestation of central bank money has the potential to revolutionise the digital payments landscape, yet the optimal approach from a legal perspective remains unclear, as the digital euro is still one of the first issuances available, with many monetary authorities around the globe waiting for this experience to provide their own legislative proposals on the matter. However, despite the interest for the topic, not so many academic works have addressed several considerations included in the Proposal. While there are many legal analyses that adopt a general approach on the concept of a central bank digital currency and its potential benefits, not many studies have addressed concrete scenarios that require specific changes in the existing legal framework, such as its distribution or the legal relationships that may arise between consumers, payment service providers, and central banks once the central bank digital currency is implemented. This issue becomes more pressing when addressed from the specific perspective of the legal euro: despite the call from some authors,[180] the digital euro could benefit from a comprehensive and holistic analysis of its Proposal, enabling the discussion within the European legal academia in order to bring de lege ferenda proposals based on the analysis of the legal act that has been published.

The implementation of the digital euro is meant to impact several legal areas, such

[180] See, e.g., Sillaber, C., & Eggen, M. (2023). The Digital Euro: An (almost) perfect equivalent to cash?. *Recht Digital, 501*.

as civil law, consumer law, privacy law, or banking law, in the European Union. In order to provide adequate academic support for its issuance, the legal academia must address all relevant topics included in the Proposal and support its final design with adequate analysis. However, this work is also aimed at providing guidance for laypersons interested in the given design of the digital euro and the opportunities for improvement that may still be considered by the European Union. With this vocation in mind, the work titled "Legal Structure of Digital Euro" has been completed to provide a comprehensive and thorough analysis of the Proposal on the establishment of the digital euro which aspires to initiate a legal discussion that results in a better access to digital payments in the European Union for all citizens, no matter their financial literacy or their digital abilities.

1.5 Methodology

To achieve the aforementioned objective in this work, the methodology of study has required a greater contextualisation of the concept of central bank digital currency (CDBC) before initiating the concrete legal analysis of the Proposal on the establishment of the digital euro for two main reasons. First, since the concept of CBDC entails a rather new technology, authors studying the phenomenon of its implementation by monetary authorities around the world have been contending essential characteristics associated to its nature, requiring a broad approach to the specific literature on the topic since 2020. Second, despite this work being focused on the legal analysis of the mentioned Proposal, the European Commission only unveiled its content in late June 2023. Consequently, the actual legal analysis has been concentrated in the last year of permanence in the Ph.D. program that promotes this Thesis.

Thus, the methodology implemented for the development of this work has focused on a thorough review of the state-of-the-art in the topics of digital payments, including relevant technologies, settlement of payment transactions, and the already existing legal framework within the European Union; central bank digital currencies, exploring extensive literature on the conceptual contextualisation, as well as architectures and technologies available for their implementation; and the digital euro itself, focusing on the Proposal for its issuance, other relevant legal documents published or commissioned directly by the European Central Bank, the Eurosystem, or the European Commission, as well as the

incipient literature that analyses several aspects of its final design as envisioned by the European legislator.

It must be also pointed out that this systematic literature review methodology has required accessing literature that goes beyond the realm of legal studies, as technical documentation and literature emanating from economic sources and authors have been also accessed and studied to complete the analysis of the upcoming implementation of the digital euro. While this approach is out of the ordinary, only in this fashion a thorough analysis of the technologies considered for the issuance of the digital euro can be performed. Otherwise, the legal definitions and descriptions of phenomena associated with its implementation cannot capture the reality they entail.

The result of this methodology of work is a study on the legal structure of the digital euro as established in the Proposal materialised in the form of a seven-chapter holistic analysis. In addition to that, a glossary [181] has also been included to provide adequate context and minimise the conceptual complexity that some categories considered in the Thesis may bring, laying the foundations for an adequate legal debate based on given considerations and not strict lucubrations. Considering this, this work is structured as follows: the present chapter,[182] provides context on the legal framework for digital payments, addresses the essential considerations surrounding the concept of central bank digital currency, and introduces the Proposal on the establishment of the digital euro. The second chapter[183] overviews the legal concept of money and introduces the analysis of Chapter III of the Proposal, namely the legal tender status of the digital euro and the limitations that may arise to the principle of mandatory acceptance that it entails. For its part, the third chapter[184] reviews the content of Chapter V of the Proposal, addressing the use of the digital euro as a store of value and a means of payment, determining the rationale for the limitations introduced by the European legislator. The fourth chapter[185] analyses the distribution of the digital euro within the euro area and outside of it, namely in Member States whose currency is not the euro and third countries, as well as the possibility of performing cross-currency payments with the digital euro, focusing on the content of Chapters IV and VI of the Proposal. The fifth chapter[186] provides a thorough

[181] See the *Glossary*.
[182] See Chapter 1 ("*Introduction*") of the Thesis.
[183] See Chapter 2 ("*The legal tender status of the digital euro*") of the Thesis.
[184] See Chapter 3 ("*The digital euro as a store of value and as a means of payment*") of the Thesis.
[185] See Chapter 4 ("*Distribution of the digital euro*") of the Thesis.
[186] See Chapter 5 ("*Technical features of the digital euro*") of the Thesis.

analysis of the technical features to be implemented with the issuance of the digital euro, as presented in Chapter VII, Sections 1 and 2, of the Proposal. In addition to that, the topics of privacy and anti-money laundering and combating the financing of terrorism are addressed in the sixth chapter,[187] mimicking the introduction of said issues in Chapters VIII and IX of the Proposal. Finally, the final chapter[188] of this Thesis acts as a closing act presenting an overview of the current design of the digital euro, prospected changes in the definitive version of the Regulation on the establishment of the digital euro, the key features analysed in this work, and future lines of research that emerge from this Thesis.

[187] See Chapter 6 ("*Privacy, data protection and AML/CFT requirements*") of the Thesis.
[188] See Chapter 7 ("*Conclusions*") of the Thesis.

Chapter 2

The legal tender status of the digital euro

The role of money in civilisation is crucial for the development of social systems as it facilitates the flow and exchange of goods and services, acting as a reference for value and enabling transactions as a medium of exchange.[1] Economic transformation has been tied to human progress since the dawn of civilisation, as trade and commerce were quintessential of any society since the Ancient Ages.[2] Barter was soon proven to be inefficient and costly for most economic transactions,[3] making it difficult to exchange resources and services at the required pace. This sharpened the ingenuity of certain economic actors by encouraging the instrumentalization of such transactions using a fungible medium of exchange.[4] Although the origin of money itself is contested,[5] understanding its foundations makes it possible to analyse its implications for many facets of our society today. Thus, understanding what characteristics an element has to present in order to qualify as money or how a manifestation comes to be considered as money, and therefore accepted as a means of exchange, enables the analysis of the optimal design for a policy that aspires to endow a currency with the status of legal tender. Such an analysis must integrate aspects that go beyond the mere study of the legal foundations that enable

[1] See Swanson, G. A., Bailey, K. D., & Miller, J. G. (1997). Entropy, social entropy and money: A living systems theory perspective. *Systems Research and Behavioral Science: The Official Journal of the International Federation for Systems Research*, *14*(1), 45-65.

[2] See Martin, F. (2013). *Money: The Unauthorised Biography*. Vintage Publishing.

[3] See *Id*.

[4] See *Id*.

[5] See Dalton, G. (1982). *Economic Systems and Society: Capitalism, Communism and the Third World.* Penguin Modern Economics.

this consideration, otherwise it will be leaving aside essential aspects that contribute to characterise what we consider money in our society.

Consequently, a holistic approach able to integrate in the analysis the complex reality of money by bringing together the interaction of the different areas of knowledge that analyse money and the essential characteristics that enable its existence seems like an adequate starting point. Thus, the study of the characteristics that make the upcoming digital euro fulfil the concept of money and allow the European Union's authorities to issue it as a digital manifestation of the single currency needs to conceptualise what is considered money in our society. The forthcoming legal analysis that is presented in this chapter is aimed at considering which characteristics enable any given good to act as money. However, it would be reckless to consider that this analysis completes the study of money and that the digital euro is meant to be considered a means of payment with legal tender status just because it satisfies the criteria of the legal academia. The inherent nature of money as an element that interrelates multiple systems, including economic, political, legal, but above all as an element of a social nature encourages its study with an integrative approach and openness to interdisciplinarity.

To achieve the objectives of analysing the validity of the digital euro as money, this chapter is structured as follows: first, the three functions of money are analysed to provide context on the legal implications of the concept of money. Second, Chapter III of the Proposal is contextualised before introducing the legal tender status of the digital euro. Third, the limitations to the principle of mandatory acceptance of the digital euro are analysed. Finally, the interaction between the digital euro and euro banknotes and coins is addressed.

2.1 Overview of the three functions of money: unit of account, store of value and means of payment

The legal academia has usually identified three functions that define a given good as money. Whenever any good can be used as a unit of account, as a store of value, and as a means of payment, it has been considered to be money. Consequently, the study of these three functions becomes essential when addressing the validity of a given financial instrument to act as money, as well as the considerations that arise from its categorisation

as legal tender, which requires its enablement in a legal disposition.

This section is structured as follows: First, a brief overview of the legal theory of money and its evolution is provided as context. Second, the three functions of money are addressed to set the contextual framework in which the rest of the analysis is performed. Finally, the three functions of money are addressed from the perspective of the implementation of the digital euro.

2.1.1 Brief overview of the legal theory of money and its evolution

An analysis on the legal theory of money requires considering various perspectives on what constitutes money, how it is used in society, and its legal character. Professor Simon Gleeson provided an analysis on what gives money its value in his work "The legal concept of money",[6] which serves as a reference to the study presented in this section, providing adequate context to understand the essential concepts surrounding the idea of money from a legal perspective, considering the progress made by the legal academia in the past centuries.

Historically, early approaches on money have been provided by economic theorists, from Menger[7] to Keynes,[8] who have focused on its three basic functions as a medium of exchange, a unit of account, and a store of value. Thus, the traditional economic view holds that money is a social institution defined by its acceptance within a community as a medium of exchange.[9] However, the intervention of public authorities in the management of monetary policy become so prominent in the assumptions concerning the validity of money that it has been articulated in the state theory of money, which determines that money is valuable because it is a valid means of payment for taxes.[10] This, however, contrasts with the ideas presented by Hayek on the absence of a requirement of public origin for money to be accepted, highlighting that the concept of money has not always been linked to public authorities and sovereignty.[11] This debate generates the question of whether the state can effectively create a category of money by just considering its

[6] See Gleeson, S. (2018). *The legal concept of money*. Oxford University Press.
[7] See Menger, K. (1892). On the origin of money. *The Economic Journal*, *2*(6), 239-255.
[8] See Keynes, J. M. (1930). *A treatise on money*. Macmillan & Co., London.
[9] See Gleeson, S. (2018), *supra* note 6.
[10] See Mann, F. A. (1992). *The legal aspect of money: with special reference to comparative private and public international law*. Oxford University Press.
[11] See Hayek, F. A. (1976). *Denationalisation of Money – The argument refined*. The Institute of Economic Affairs.

inclusion in an official source of law, which seems to be the case in the present time, with sovereign states being able to issue its own currency that is accepted as money within their jurisdictions.[12]

In any case, the adequate definition of money and its basic characteristics has become more difficult to achieve with the emergence of private institutions participating in the financial intermediation, namely private banks and credit institutions, able to create commercial bank money[13] through its lending activities.[14] In addition to the appearance of virtual currencies, such as crypto-assets,[15] the adequate definition of what constitutes money has grown troublesome, as sovereign states no longer hold the monopoly on its creation[16] In this context, the analysis of the three basic functions of money as traditionally considered -a medium of exchange, a unit of account, and a store of value- requires adjustment to adequately describe the nature of money in its modern modalities, which includes central bank digital currencies (CBDCs) like the digital euro.

2.1.2 The three functions of money revisited

The evolving nature of money recommends revisiting the three functions of money to ensure their considerations are properly aligned with the specific nature of modern modalities of money, in particular CBDCs. The three characteristics of money can be useful when describing a gold coin but fail to explain modern phenomena such as bank money or digital currencies, no matter their origin.[17] Intangibility requires a deeper analysis, but legal academia has already dealt with commercial bank money to address its limits.[18]

The inherent value of the precious metal used in the process cannot explain the value of money nowadays, as banknotes and coins are more valuable than the material used in their creation, in line with the concept of *seigniorage*.[19] [20] In addition to that, commercial

[12] See Gleeson, S. (2018), *supra* note 6.
[13] See "*Commercial bank money (CBM)*" in the *Glossary*.
[14] See Gleeson, S. (2018), *supra* note 6.
[15] See "*Crypto-asset*" in the *Glossary*.
[16] But see Hayek, F. A. (1976) *supra* note 11. Hayek suggested that sovereign states did not have such monopoly in the first place, making the current scenario the norm, and not the exception.
[17] See Gleeson, S. (2018), *supra* note 6.
[18] See *Id*. From a legal perspective, money can be considered as such when it allows an individual to discharge from a debt by using it and the creditor accepts it. This consideration is closely linked to the concept of legal tender, which will be addressed later in this Chapter.
[19] See "*Seigniorage*" in the *Glossary*.
[20] See *How much does it cost to produce currency and coin?*, Board of Governors of the Federal Re-

bank money, as well as other digital manifestations of money, is not represented physically, yet it comprises the majority of the existing money.[21]

While all three functions qualify the concept of money, the consideration on which one is the most important has been contended. Thus, for Keynes it was the consideration of money as a unit of account,[22] while for Menger it was the consideration of a medium of exchange.[23] In any case, it is the interaction of all three that enables the determination of the concept of money, hence their analysis in the next three sub-sections.

2.1.2.1 Unit of account

The characteristic of money as unit of account denotes its role in providing a common measure for valuing goods and services, becoming an essential function for pricing, accounting, and economic calculation.[24] According to Keynes, the true definition of money is as unit of account, as he observes that the concept of purchasing power can only be understood using money as a numerical reference of the ability to acquire goods and services with it.[25] This means that money is required to serve as a numerical unit of measurement of market value.[26]

From a historical perspective, money has fulfilled this function over time, even before the face value of a physical means of payment[27] acted as a valid unit of account. For instance, the shilling and the pound in England provided a valid reference as unit of account long before they were minted into physical coins.[28] Nowadays this characteristic is readily apparent in banknotes and coins issued by central banks of sovereign states,

SERVE SYSTEM. Available at: https://www.federalreserve.gov/faqs/currency_12771.htm. Last accessed on September 18, 2024. See also *Report on a digital euro*, EUROPEAN CENTRAL BANK – EUROSYSTEM. Available at: https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf. Published in October 2020. Last accessed on September 16, 2024.

[21] See *Monetary aggregates*, EUROPEAN CENTRAL BANK – EUROSYSTEM. Available at: https://www.ecb.europa.eu/stats/money_credit_banking/monetary_aggregates/html/index.en.html. Last accessed on September 18, 2024. Compare the historical time series for the monetary aggregates M1 and M2 to understand the impact of commercial bank money on nowadays finance.

[22] See Keynes, J. M. (1930), *supra* note 8.

[23] See Mann, F. A. (1992), *supra* note 10.

[24] See Gleeson, S. (2018), *supra* note 6.

[25] See Keynes, J. M. (1930), *supra* note 8.

[26] See Gleeson, S. (2018), *supra* note 6.

[27] See subsection 2.3.2 "*Full face value*" below.

[28] See Fox, D. (2014). Case Study: The Case of Mixt Monies. *Money in the Western Legal Tradition: Middle Ages to Bretton Woods*. (Oxford University Press, 2015 Forthcoming), University of Cambridge Faculty of Law Research Paper, (70).

although it is harder to ascertain for digital manifestations of money.[29]

Thus, it could be argued that commercial bank money deposits do not present value as a unit of account, since they reference a specific currency. This could enable the debate over the ability of digital funds, as created by credit institutions through their financial intermediation function, to present inherently this characteristic of money. However, precisely because of their reference to a sovereign currency, digital funds are considered to act as a digital manifestation of banknotes and coins and, despite not being considered a digital form of central bank money,[30] they comply with the requirements to hold these characteristics.

In any case, the apparent contradiction introduced in the previous paragraph can be solved with the introduction of new payment technologies. As described in the previous chapter,[31] CBDCs are considered to be the digital manifestation of central bank money. Consequently, its implementation would enable a referential system in digital form to act as unit of account for intangible manifestations of money, satisfying all requirements as considered by the academia when describing the essential characteristics of money to fulfil this function.

2.1.2.2 Store of value

For its part, the store of value function of money refers to its ability to preserve value over time, allowing individuals to defer consumption until a future date,[32] which is essential in economies with a capitalist base. Researchers believe this characteristic of money to have become the first to be explicitly addressed in history, despite the general believe of the function of medium of exchange being it.[33]

Because of its implications, the analysis of this characteristic of money recommends a delicate treatment of its content in order to avoid conceptual errors. The store of value functionality of money is not a full guarantee that the money will appreciate in value, but that its use can be postponed until a later date with a reasonably stable assurance that its value will be similar. Money revalue is only one possible manifestation of the store of

[29] See Gleeson, S. (2018), *supra* note 6.
[30] See "*Central bank money*" in the *Glossary*.
[31] See subsection 1.2.1 "*The concept of CBDC*" in Chapter 1 of the Thesis.
[32] See Gleeson, S. (2018), *supra* note 6.
[33] See Jevons, W. S. (1989). Money and the Mechanism of Exchange. In *General Equilibrium Models of Monetary Economies* (pp. 55-65). Academic Press.

value characteristic, but it is not inherent to it. Consequently, the physical manifestation of money, namely banknotes and coins, does not revalue on its own over time, likely to fall victim to the economic phenomenon of inflation and deflation, yet it provides a stable manifestation of wealth that can be deferred for future uses. Commercial bank money, for its part, contributes to serve this function in modern economies being able to provide financial yield to deposits able to mitigate the effect of inflation and deflation over money.[34]

The emergence of crypto-assets has enabled the debate on whether the function of store of value is guaranteed, because of their high volatility. While some of their manifestations, like stablecoins,[35] may offer a stable value their high risk, sometimes materialised in crashes in the market,[36] prevent authors from ensuring its applicability. On the other hand, while its applicability to CBDCs should be automatic, as risk is not part of the equation, central banks may be considering its limitation to avoid unwanted competition with commercial banks.[37] The specific analysis for the digital euro, which involves the existence of holding limits and the absence of interest-bearing functionalities, is addressed in the next chapter.[38]

2.1.2.3 Medium of exchange

The role of money as a medium of exchange has been considered as an inherent characteristic of money, arguably the most defining of the three considered in this section. As a medium of exchange, money can circulate within an economy, enabling the trade of goods and services efficiently among individuals and business, eliminating the inefficiencies of barter.[39]

Both central bank money and commercial bank money comply with this function of money. While the first, in the form of banknotes and coins, constitutes the most basic manifestation of means of payment that exists in modern economies, the latter

[34] See Gleeson, S. (2018), *supra* note 6.

[35] See "*Stablecoin*" in the *Glossary*.

[36] See Liu, J., Makarov, I., & Schoar, A. (2023). *Anatomy of a run: The terra luna crash* (No. w31160). National Bureau of Economic Research. Stablecoin Terra (UST) spectacularly crashed in May 2022 despite its appearance of stability and financial equivalence to the US dollar.

[37] See subsection 3.2.3 "*Limits to the use of the digital euro as a store of value - Article 16 Proposal*" in Chapter 3 of the Thesis.

[38] See section 3.2 "*The use of the digital euro as a store of value - Articles 15 and 16 Proposal*" in Chapter 3 of the Thesis.

[39] See Menger, K. (1892), *supra* note 7.

has contributed with the development and implementation of new means of payment that contribute to make payments faster and safer.[40] Thus, unlike physical currencies, commercial bank money allows for large-scale and nearly-instantaneous transactions, supporting the complex needs of contemporary commerce.[41]

While crypto-assets may facilitate peer-to-peer transactions minimising the number of financial intermediaries involved in the transaction, their acceptance as a reliable medium of exchange is not as widespread because of their high volatility. In this context, CBDCs may be in the right place to bring prospective users with a public alternative to the currently existing digital means of payment, with virtually no risks associated and the benefits of central bank money. Similarly to the previous sub-section, the specific implications of the use of the digital euro as a means of payment are addressed in the next chapter.[42]

2.1.3 The three functions of money and the digital euro

The European legislator addresses explicitly in the Proposal on the establishment of the digital euro[43] the use of the digital euro as a store of value and as a means of payment explicitly in its Chapter V.[44] However, its use as a unit of account can only be inferred from the content of Chapter III in the Proposal, referred to the legal tender status of the digital euro.[45] [46] With this structure, the European legislator has mimicked the categories proposed by the legal academia when determining that the digital euro is, indeed, legal money as it is presented in the Proposal. However, merely listing those characteristics it is not enough, as essential consequences emanate from the proclamation of each of the

[40] See Velde, F. R. (1998). Lessons from the History of Money. *Economic Perspectives-Federal Reserve Bank of Chicago*, *22*, 2-16. Currencies developed during the Middle Ages contributed to create safer transactions, hence improving trade. Similarly, digital manifestations of commercial bank money have revolutionised transactions in the past decades.

[41] See Gleeson, S. (2018), *supra* note 6.

[42] See section 3.3 "*The use of the digital euro as a means of payment - Articles 15 and 17 Proposal*" in Chapter 3 of the Thesis.

[43] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Hereinafter, "the Proposal."

[44] See Chapter V ("*Use of the digital euro as a store of value and as a means of payment*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[45] See Chapter III ("*Legal tender*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[46] The digital euro as a unit of account is extracted from the consequences of the proclamation of the legal tender of the digital euro. However, the legal tender status of the digital euro implies additional considerations, as described in section 3 ("*Legal tender status of the digital euro – Article 7 Proposal*") of this Chapter.

three characteristics, as previously introduced in this section.

Consequently, the analysis in this chapter focuses on the unit of account characteristic and its manifestation through the legal tender status of the digital euro.[47] The other two characteristics of money, store of value and means of payment, are suitably addressed in the next chapter,[48] mirroring the structure presented in the Proposal.

2.2 Intro to Chapter III Proposal

Chapter III ("Legal tender") of the Proposal[49] addresses the legal tender status of the digital euro. In its articles, Chapter III imposes the legal tender status to the central bank digital currency of the European Union, currently in development. Thus, Article 7 of the Proposal proclaims its legal tender status and determines that the digital euro shall have mandatory acceptance, at full face value with the power to discharge from a payment obligation.[50] The following articles, for their part, contribute by qualifying said legal tender status considering limitations and other relevant nuances. In particular, Article 8 of the Proposal determines the territorial scope of the legal tender status of the digital euro.[51] For its part, Article 9 of the Proposal introduces general exceptions to the obligation to accept the digital euro,[52] while Article 10 of the Proposal establishes the prohibition of excluding unilaterally payments made with digital euro.[53] In the same line, Article 11 of the Proposal introduces additional exceptions to the legal tender status of the digital euro, in this case monetary law.[54] Finally, Article 12 of the Proposal addresses

[47] See sections 2.2 "*Intro to Chapter III Proposal*", 2.3 "*Legal tender status of the digital euro – Article 7 Proposal*", 2.4 "*Limitations to the principle of mandatory acceptance*" and 2.5 "*Interaction between the digital euro and euro banknotes and coins – Article 12 Proposal*" below in this Chapter.

[48] See sections 3.2 "*The use of the digital euro as a store of value - Articles 15 and 16 Proposal*" and 3.3 "*The use of the digital euro as a means of payment - Articles 15 and 17 Proposal*" in Chapter 3 of the Thesis.

[49] See Chapter III ("*Legal tender*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[50] See Article 7 ("*Legal tender status*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[51] See Article 8 ("*Territorial scope of legal tender status*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[52] See Article 9 ("*Exceptions to the obligation to accept the digital euro*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[53] See Article 10 ("*Prohibition of the unilateral exclusion of payments in the digital euro*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[54] See Article 11 ("*Additional exceptions of a monetary law nature*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro.

the expected interaction between the digital euro and euro banknotes and coins.[55]

The analysis of Chapter III of the Proposal is justified to take place in this chapter of the Thesis because of the eminent importance of the proclamation of the legal tender status of the digital euro. While the characteristic of unit of account may be inferred for the digital euro based on its legal tender status,[56] the other two characteristics, store of value and means of exchange, emanate directly from said legal tender status. Consequently, their analysis in the next chapter of the Thesis obeys to the rationale of providing adequate context on the legal tender status of the digital euro and its consequences, similarly to the structure proposed by the European legislator in the Proposal, only addressing the use of the digital euro as a store of value and as a means of payment after addressing the content of Chapter III.

The rest of the chapter is structured as follows: first the legal tender status of the digital euro is analysed. Then, its limitations, as presented in the Proposal, are addressed. Finally, the specifics concerning the interaction between the digital euro and euro banknotes and coins are considered.

2.3 Legal tender status of the digital euro – Article 7 Proposal

The legal academia has discussed whether money has to be imposed by states and public institutions[57] or whether any valuable asset that is generally accepted may become money,[58] indirectly addressing the consideration of legal tender. While citizens in the European Union may decide not to use the digital euro after its first issuance, this will not affect its consideration as valid manifestation of money, the digital counterpart of the single currency. As long as certain payees are required to accept the digital euro, discharging the payer from debt obligations, is enough to ensure the validity of the legal tender status of the digital euro. However, it could be argued that it is not the legal

COM/2023/369 final.

[55] See Article 12 ("*Interaction between the digital euro and euro banknotes and coins*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[56] See *supra* note 45.

[57] See sections 1.4.2. "*Can law make a thing valuable as money?*" and 1.4.3. "*How should the courts decide what is money?*" in Gleeson, S. (2018), *supra* note **??**.

[58] The value of crypto-assets is usually linked to a basic net-effect: despite its apparent absence of value, should enough users be willing to accept them as a means of payment, they become valuable.

imposition which enables the validity of the digital euro as money, but the likely proactive action of several users to accept it as payment.[59]

The proclamation of the legal tender status[60] of the digital euro is made by the European legislator in Article 7, point 1, of the Proposal,[61] which is likely to be the most important asseveration made throughout the entire Proposal because of its implications. In its point 2, Article 7 makes explicit the immediate consequences of said statement: The legal tender status of the digital euro shall entail its mandatory acceptance, at full face value, with the power to discharge from a payment obligation.[62] [63] Following the structure presented in the Proposal, each of those three manifestations of the legal tender status of the digital euro are addressed separately in the next sub-sections.

[59] It could be argued that the legal tender status of the digital euro does not require a written manifestation to be conceded, because some payees would be willing to accept it as a repayment of a debt originated in euro since it is just a digital manifestation of the single currency. Since it could be argued that the digital euro it is, in fact, the same as euro banknotes and coins, its legal tender status would not require explicit reference. The reader should bear in mind that the proclamation of the legal tender status for the physical euro was only explicit in Article 128 of the Treaty on the Functioning of the European Union and never again developed until the publication of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the legal tender of euro banknotes and coins (COM/2023/364 final) without altering its acceptance.

[60] The legal tender status of euro banknotes and coins was never explicitly established in the European Union. Thus, aside from its mention in Article 128 of the Treaty on the Functioning of the European Union, the legal tender of the single currency was only defined in the Commission Recommendation of 22 March 2010 on the scope and effects of legal tender of euro banknotes and coins. This lack of a proper definition has hampered the development of the digital euro from the very beginning, since the possibility of its issuance by the European Central Bank was not clear initially because of the lack of a legal binding instrument aside from the general reference in the Treaties. While the Proposal ensures the legal tender status and its implications for the digital euro, the European legislator has also addressed this issue for its physical counterpart with the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the legal tender of euro banknotes and coins (COM/2023/364 final.) See section 2.5 "*Interaction between the digital euro and euro banknotes and coins – Article 12 Proposal*" later in this Chapter to understand the expected interaction between the digital euro and euro banknotes and coins.

[61] See Article 7, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[62] See Article 7, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[63] The European legislator has promoted with legal force the content of the conditions for the legal tender status of euro banknotes and coins laid down by the Court of Justice in joined cases C-422/19 and C-423/19, Hessischer Rundfunk, EU:C:2021:63 point 46. The Court determined concerning the legal tender status that "*a means of payment cannot generally be refused in settlement of a debt denominated in the same currency unit, at its full-face value, with the effect of discharging the debt*." In line with the content of Article 7 of the Proposal, the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the legal tender of euro banknotes and coins (COM/2023/364 final,) also references explicitly these characteristics.

2.3.1 Mandatory acceptance

Mandatory acceptance of the digital euro is addressed in Article 7, point 3, of the Proposal.[64] Consequently, the European legislator has established that the payee shall not refuse digital euro tendered in payment to comply with a given obligation, in accordance with the principle of mandatory acceptance.[65] [66] However, despite the authoritative language used in the provision, the mandatory acceptance of the digital euro is not absolute and the Proposal presents limits and exceptions in the next articles.[67] The principle of mandatory acceptance could generate tension towards relevant operators in digital euro payment transactions,[68] hence the necessity for a regulation that ensures its general acceptance but allows for exceptions. In fact, later in the Proposal,[69] the European legislator implements an incentives system to attract payment service providers (PSPs) instead of imposing to them the obligation of accepting the digital euro as a means of payment because doing so proves to be more effective.[70]

2.3.2 Full face value

For its part, full face value acceptance of the digital euro is addressed in Article 7, point 4, of the Proposal.[71] Accordingly, the monetary value of digital euro tendered in payment of a debt shall be equal to the value of the monetary debt.[72] In addition to that, the Proposal establishes that any surcharges on the payment of debt with the digital euro shall be prohibited.[73] Several aspects may be considered in relation to this provision.

[64] See Article 7, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[65] *Id*.

[66] Despite being explicitly addressed for the first time in Article 11 of the Proposal, the principle of mandatory acceptance emanates from Article 7 of the Proposal.

[67] See section 2.4 "*Limitations to the principle of mandatory acceptance*" in Chapter 2 of the Thesis.

[68] See subsection 3.3.2 "*Tension: mandatory acceptance vs. free use by the citizenry*" in Chapter 3 of the Thesis. While the arguments used in Chapter 3 refer to the use of the digital euro as a means of payment, another of the characteristics of money to be studied, the analysis of the tension described therein is also useful when analysing the principle of mandatory acceptance. Payment service providers (PSPs) are more likely to get involved in the distribution of the digital euro if the system rewards them fairly for doing so, instead of punishing them for not taking part accordingly.

[69] See Article 17 ("*Fees on digital euro payment services*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[70] See subsection 3.3.4 "*Charges to merchants and inter-PSP fees*" in Chapter 3 of the Thesis.

[71] See Article 7, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[72] *Id*.

[73] *Id*.

First, the digital euro cannot be valued below its face value according to Article 12, point 1, of the Proposal.[74] Since the digital euro is equated to the euro banknotes and coins it also constitutes the monetary unit, becoming the reference for payment systems using euro as their reference currency. This manifestation establishes that the digital euro complies with the function of unit of account, as previously introduced in this Chapter.

Second, since surcharges on the payments of debt with the digital euro shall be prohibited,[75] the legal tender status of the digital euro is reinforced. Whenever a payee is accepting a means of payment with no legal tender status, she might be refusing it or charging for its acceptance. A payee is only required to accept a given means of payment because of its legal tender status, despite her possible willingness to accept means of payment with no legal tender for different reasons.[76]

Considering the Proposal for a Regulation on the legal tender of euro banknotes and coins,[77] which accompanies the present Proposal and it is aimed at complementing it,[78] a definition of "face value" is provided. Thus, Article 3, point 7, of the Proposal for a Regulation on the legal tender of euro banknotes and coins determines that "face value" *means the denomination in euros of a euro banknote or coin, as printed on that banknote or minted on that coin*. While this definition is in line with the classic concept of face value,[79] it should be adequately updated for the digital euro.[80] There is no "print" or "mint" in the case of the digital, since there is only a numeric representation of the holdings still available in the digital euro payment account. Even though the unit of account used is still the euro, as well as euro cents, a definition that refers to a physical attribute of euro banknotes and coins cannot be applicable to an intangible good such as the digital euro.

[74] See Article 12, point 1, of the of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[75] See *supra* note 70.

[76] A merchant may be willing to accept alternative means of payment without legal tender status because they are generally accepted or demanded by consumers.

[77] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the legal tender of euro banknotes and coins. COM(2023) 364 final.

[78] See *infra* note 80.

[79] See, e.g., *Face value*, Oxford Learner's Dictionary. Available at: https://www.oxfordlearnersdictionaries.com/us/definition/english/face-value?q=face+value. Last accessed on October 30, 2024. Face value is considered to be "*the value of a stamp, coin, ticket, etc. that is shown in the front of it*."

[80] See point 1 ("CONTEXT OF THE PROPOSAL – Reasons for and objectives of the proposal") of the Explanatory Memorandum that accompanies the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the legal tender of euro banknotes and coins (COM(2023) 364 final.) Consistency with the Proposal that enables the establishment of the digital euro is ensured, however the content of this paragraph highlights an inconsistency that affect essential definitions for both Proposals and it should be amended by the European legislator.

2.3.3 With the power to discharge from a payment obligation

Finally, the power to discharge from a payment obligation of the digital euro is established in Article 7, point 5, of the Proposal.[81] Accordingly, a payer shall be able to discharge himself from a payment obligation by tendering digital euro to the payee, with the exception of the limitations laid down by the Proposal concerning the territorial scope of the digital euro,[82] the principle of good faith,[83] and the express prior agreement between the parties to use a different means of payment.[84]

The power to discharge from a payment obligation appears as the reasonable consequence of the two previous characteristics addressed. Should a payee be obliged to accept a payment made by a payer using the digital euro, she is ensured to receive the full-face value of the transaction. Consequently, the debt is extinguished, as considered by civil law.[85]

2.3.4 Legal tender status and programmable money

The Proposal addresses the possibility of implementing conditional payments for the digital euro in its Article 24,[86] explicitly determining that the digital euro cannot be considered equivalent to programmable money. While both definitions[87] provided by the European legislator are contented,[88] the explicit rejection of the digital euro becoming programmable money impacts its legal tender status, as referenced by the European Central Bank, recommending its analysis in this sub-section.

Thus, the European Central Bank has confirmed that the digital euro shall not become programmable money by stating that providing the digital euro with characteristics of programmable money, as defined in the Proposal, would be inconsistent with its legal

[81] See Article 7, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[82] See subsection 2.4.1 "*Territorial scope – Article 8 Proposal (Recital (17))*" below. The territorial scope of the digital euro is addressed in Article 8 of the Proposal.

[83] See subsection 2.4.2.1 "*Exceptions in Article 9 Proposal (Recitals (18) and (19))*" below. The principle of good faith is addressed in Article 9, letter b), of the Proposal.

[84] See *Id*. An agreement on such terms is addressed in Article 9, letter d), of the Proposal.

[85] See, e.g., Article 1156 *Código civil* for the Spanish jurisdiction or Article 1277 *Codice civile* for the Italian jurisdiction.

[86] See Article 24 ("*Conditional digital euro payment transactions*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[87] See "*Conditional digital euro payment transaction*" and "*Programmable money*" in the *Glossary*.

[88] See subsection 5.2.4.2 "*Contrast to programmable money*" in Chapter 5 of the Thesis.

tender status.[89] In particular, this would clash with the considerations laid down in Article 12 of the Proposal[90] concerning its acceptance at full face value, and would entail that the digital euro would not be fungible neither with other units of digital euro, nor with euro banknotes and coins at par.[91] The monetary authority of the euro zone also confirms that, even if no limitation such as that in Article 24, point 2, of the Proposal were to be included, the issuance of programmable money by the European Central Bank would be incompatible with the Treaties.[92]

2.4 Limitations to the principle of mandatory acceptance

As previously introduced in the previous section of this chapter, the principle of mandatory acceptance of the digital euro is not an unlimited imposition made by the European Union to all citizens that may be transacting with the new digital manifestation of the single currency. The Proposal addresses in its Articles 8 to 10[93] the limitations currently considered, while Article 11 enables the European Commission to supplement the Proposal should additional exceptions of monetary law nature must be considered.[94] In accordance, this section is structured to analyse each of the mentioned provisions, following the structure present in the Proposal.

2.4.1 Territorial scope – Article 8 Proposal (*Recital (17)*)

The Proposal initiates its enumeration of limitations of the legal tender status of the digital euro in Article 8.[95] Thus, the legal tender status of the digital euro is limited with respect to the nature of the payment transaction, offline or online, as well as the geography of the parties involved.[96]

[89] See section 14.1 "*Conditional payments and programmable money*" of the 1 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).

[90] See *supra* note 74.

[91] *Id*.

[92] *Id*.

[93] See Articles 8 ("*Territorial scope of legal tender status*"), 9 ("*Exceptions to the obligation to accept the digital euro*"), and 10 ("*Prohibition of the unilateral exclusion of payments in the digital euro*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[94] See *supra* note 54.

[95] See *supra* note 51.

[96] Despite being expressly referenced in Article 8 of the Proposal, online and offline digital euro payments and their implications for the issuance of the digital euro are not adequately addressed in the Proposal until Article 23 ("*Offline and online digital euro payment transaction*.")

Thus, the digital euro will only have legal tender status for offline payments of a monetary debt denominated in euro that take place within the euro area, according to Article 8, point 1, of the Proposal.[97] For its part, point 2 of the same article determines that the digital euro will only have legal tender status for online payments of a monetary debt denominated in euro to a payee residing or established in the euro area.[98]

Concerning offline digital euro payment transactions, despite the apparent existence of specific consequences for payments made outside the euro area, equivalent consequences are given to payments using euro banknotes and coins. Since offline payments require proximity between parties,[99] the European Union authorities can only bind users that are both present in the euro area at the time of the payment. Similarly, the legal tender status of the physical euro cannot be imposed outside its jurisdiction, hence the common consideration.

In what respects to online digital euro payment transactions, the language in the provision makes clear that the geography of the payee is the only one relevant, which is sensible. According to the rule, a merchant established in the euro area should be bound by this obligation, no matter the geography of the user who is acquiring the goods. Contrarily, a merchant from outside the euro area cannot be bound by this obligation even if the payer is from the euro area. Since the only merchant under the territorial scope of the European Union is the first one, the obligation can only be imposed to that one. Consequently, a payer not residing or established in the euro area with access to a digital euro payment account will be able to initiate a transaction with a merchant within the euro area.[100]

2.4.2 Other exceptions and prohibitions that apply to the obligation to accept the digital euro – Articles 9, 10 and 11 Proposal

The Proposal addresses multiple scenarios in which acceptance of the digital euro might be refused in Articles 9, 10 and 11. Each of the provisions require a separate analysis

[97] See article 8, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[98] See article 8, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[99] See subsection 5.2.3.1 "*The special consideration for transactions in a proximity payment – Article 23(3) Proposal*" in Chapter 5 of the Thesis.

[100] This interaction will be bound by Article 13, point 1, of the Proposal, which will be disclosed later in Chapter 5 of the Thesis.

to ensure all particularities, as well as the interactions between them, are addressed accordingly. Thus, each of the next sub-sections analyses the aforementioned articles in the same order as they are presented to the reader in the Proposal.

2.4.2.1 Exceptions in Article 9 Proposal (*Recitals (18) and (19)*)

Article 9 of the Proposal enumerates, in its four letters, the cases in which a payee shall be entitled to refuse digital euro.[101] [102] Each of the exceptions presents particularities that must be analysed in depth, because of their implications in other provisions of the Proposal.

Thus, letter a) to that Article[103] determines that the following payees are entitled to refuse a payment made in digital euro: an enterprise[104] which employs fewer than 10 persons, or whose annual turnover or annual balance sheet total does not exceed €2 million,[105] or is a non-profit legal entity[106] as defined in[107] Article 2 of Regulation (EU) 2021/695.[108] This provision applies unless any of the described parties accept comparable means of payment[109] in its core operations.[110]

[101] See *supra* note 52.

[102] Article 9 of the Proposal establishes that the exceptions that it enumerates shall be considered in connection with Article 7, point 3, -principle of mandatory acceptance- and Article 8 of the Proposal -territorial scope of the digital euro-.

[103] See article 9, letter a), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[104] See "*Enterprise*" in the *Glossary*.

[105] See Article 2 ("*Staff headcount and financial ceilings determining enterprise categories*"), point 1, of Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. Both criteria are used to qualify an enterprise as a "*microenterprise*." See also "*Microenterprise*" in the *Glossary*.

[106] See "*Non-profit legal entity*" in the *Glossary*.

[107] A minor printing mistake is present in letter a) of Article 9 of the Proposal where the preposition "in" is repeated.

[108] See Article 2, point 18, of Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013.

[109] See "*Comparable means of payment*" in the *Glossary*.

[110] Recital (58) of the Proposal qualifies the content of this provision. In particular, the Recital determines that "*exceptions to mandatory acceptance should also be provided for microenterprises, which are particularly important in the euro area for the development of entrepreneurship job creation and innovation, playing a vital role in shaping the economy. Union policies and actions should reduce regulatory burdens for enterprises of this size. Exceptions to mandatory acceptance should also be provided for non-profit legal entities which promote the public interest and serve the public good performing a variety of goals of societal interest, including equity, education, health, environmental protection and human rights. For microenterprises and non-profit legal entities, the acquisition of the required infrastructure and the acceptance costs would be disproportionate.*" However, while these entities are subject to the principle of mandatory acceptance, the Recital wisely determines that "*microenterprises and non-profit legal entities that do not accept comparable digital means of payment from their payers in settlement of a debt (e.g. they only accept euro banknotes and coins), but may use digital payments in settlement of a debt to their payees (e.g. they pay with credit transfers), should not be*

After that, letter b) to Article 9 of the Proposal[111] addresses the validity of a refusal that is made in good faith and is based on legitimate and temporary grounds in line with the principle of proportionality, in view of concrete circumstances beyond the control of the payee. The Proposal also establishes that the burden of proof to establish that legitimate and temporary grounds existed in a particular case and that the refusal was proportionate shall be on the payee.[112] [113] As defined, the scenarios considered by the European legislator are close to the consideration of *force majeure*,[114] which should not require explicit treatment in the provision. In connection with the good faith principle, as proclaimed in the Commission Recommendation of 22 March 2010 on the scope and effects of legal tender of euro banknotes and coins, the European legislator is likely to be addressing scenarios concerning the impossibility of processing a digital euro payment transaction because of unintended actions, mostly technological.[115] Thus, should those actions become intended,[116] they will not be considered legitimate and the payer will be entitled to complete the payment transaction using the digital euro as a means of payment.

For its part, Article 9, letter c), of the Proposal[117] establishes the possibility for a natural person acting in the course of a purely personal or household activity to reject a digital euro payment. While the Proposal acknowledges the usefulness and adequacy of this provision,[118] no definition whatsoever is provided for "*personal or household activities*".[119]

subject to the mandatory acceptance of payments in digital euro."

[111] See article 9, letter b), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[112] See article 9, last paragraph, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[113] From a structural perspective, there is no justification for the placement of this final provision in Article 9. Since it only affects letter b), as expressly determined, it could have been included following the last sentence in said letter, hence improving the readability of the Article. The European legislator is encouraged to consider implementing this minor amendment.

[114] E.g., using Spanish civil law, Article 1105 of the Civil Code ("*Código civil*") determines that "*apart from the cases expressly mentioned in the law, and those in which the obligation so declares, no one shall be liable for those events which could not have been foreseen, or which, if foreseen, were unavoidable*."

[115] E.g., the point-of-sale system equipment is not accepting payment transactions because it needs to be fixed or because the internet connection is not currently working.

[116] In the examples provided *Id*., it is the merchant who lies about those circumstances to reject digital euro payment transactions.

[117] See article 9, letter c), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[118] See Recital 18 of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[119] See *Id*. While said recital also addresses them, no definition nor examples are provided. The European legislator is encouraged to provide clarification on the concept to ensure its application can be smooth.

Finally, letter d) to Article 9 of the Proposal[120] determines the possibility to reject a digital euro payment when, prior to the payment, the payee has agreed with the payer on a different means of payment, subject to the content of Article 10 of the Proposal.[121] Consequently, this provision can only be applicable should the agreement be negotiated in advance and individually.[122]

2.4.2.2 Prohibition of the unilateral exclusion of payments in the digital euro – Article 10 – Directive 93/13/EEC

Closely linked to the content of Article 9, letter d),[123] Article 10 of the Proposal[124] states that payees subject to the obligation to accept the digital euro shall not use contractual terms that have not been individually negotiated to refuse the acceptance of digital euro as a means of payment for monetary debts denominated in euros. The Proposal also forbids commercial practices which have the same object, effectively preventing individuals from satisfying debts denominated in euros using the digital euro.[125] For such contractual terms or commercial practices, the Proposal provides the same consequence, becoming not binding on the payer.

As previously reviewed,[126] Article 9, letter d), of the Proposal allows for the negotiation of a different means of payment as long as it is negotiated in advance. In any case, individual negotiation is required for this clause to be binding. The Proposal provides a definition on what can be regarded as "*contractual term not individually negotiated*"[127] considering those scenarios in which the contractual term has been drafted in advance, causing the payer to become unable to influence the substance of the term, particularly in the context of a pre-formulated standard contract. This definition falls in line with consumer law in the European Union, as it directly paraphrases the content of Directive 93/13/EEC.[128] [129]

[120] See article 9, letter d), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[121] See *supra* note 53.
[122] See subsection 2.4.2.2 "*Prohibition of the unilateral exclusion of payments in the digital euro – Article 10 – Directive 93/13/EEC*" below.
[123] See *supra* note 120.
[124] See *supra* note 53.
[125] *Id*.
[126] See subsection 2.4.2.1 "*Exceptions in Article 9 Proposal (Recitals (18) and (19))*" above.
[127] See "*Contractual term not individually negotiated*" in the *Glossary*.
[128] See Article 3, point 2, of Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts.
[129] See Judgment of the Court (First Chamber) of 3 June 2010, Case C-484/08. *Caja de Ahorros y Monte*

This provision has been included by the European legislator in anticipation of commercial actors that may prevent the use of digital euro payment accounts by redirecting users to their own means of payment. In particular, Article 10 of the Proposal may be seen as a counterpoint that brings back the equilibrium to the legal tender status of the digital euro and its limitations, as laid down in Chapter III of the Proposal. Thus, free competition between the digital euro and comparable means of payment is ensured, yet arbitrary exclusions of the first, when unduly negotiated, will not be binding for the payer.

2.4.2.3 Additional exceptions of a monetary law nature – Article 11 Proposal

Article 11 of the Proposal[130] establishes that the European Commission is empowered to adopt delegated acts in accordance with Article 38[131] supplementing the Proposal whenever additional exceptions of a monetary nature to the principle of mandatory acceptance of the digital euro have been identified. As Recital (81) highlights,[132] Article 290 TFEU[133] enables the Commission to be delegated by a legislative act the power to adopt non-legislative acts of general application to supplement or amend certain elements of such legislative act. The rationale for this authorisation can be found in the promptness required to attend certain scenarios that have not been foreseen. The European Commission is the right authority to provide such measures, as it must ensure the promotion of the general interest of the European Union and take appropriate initiative to that end.[134] The so-called exceptions of a monetary law nature fall in this category, hence the enablement made by Article 38 of the Proposal.[135] In any case, the European Commission is required to consult the European Central Bank when preparing those delegated acts, ensuring that an expert analysis is involved in the process of design and adoption to ensure its adequacy and accurateness to the needs that have been identified.

de Piedad de Madrid v Asociación de Usuarios de Servicios Bancarios (Ausbanc).

[130] See *supra* note 54.

[131] See article 38 ("*Delegated acts*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[132] See Recital (81) of the Proposal. The European legislator points out the power embedded in the European Commission by the Article 290 of the Treaty of Functioning of the European Union to adopt delegated acts whenever it has been enabled to do so.

[133] See Article 290 of the Treaty on the Functioning of the European Union.

[134] See Article 17, point 1, of the Treaty on the Functioning of the European Union.

[135] The Proposal has enabled the European Commission to adopt delegated acts only for two topics: the exceptions to the principle of mandatory acceptance here discussed, and the categories of personal data that PSPs, the ECB, the national central banks and the providers of support services will be able to process. The second topic will be analysed in subsection 6.3.1.3 "*Delegated acts in accordance with Article 38*" in Chapter 6 of the Thesis.

However, the Proposal never addresses the concept of "*exceptions of a monetary law nature*" in its provisions. Recital (19) of the Proposal briefly expands the basis for this authorisation laid down in the European Commission, yet it does so vaguely.[136] Thus, the aforementioned Recital determines that additional exceptions may be introduced taking into consideration any proposals from Member States to this end, and that the European Commission may only adopt such exceptions if they are necessary, justified on grounds of general interest, proportionate, and preserve the effectiveness of the legal tender status of the digital euro.[137] This statement, while not substituting a definition that would still be recommended,[138] provides an insightful idea of what these exceptions, should they be adopted, would entail.[139]

In order to be applicable, the Proposal requires that these exceptions shall be justified by an objective of public interest and proportionate to that aim, shall not undermine the effectiveness of the legal tender status of the digital euro, and shall only be permitted provided that other means for the payment of monetary debts are available.[140] The limits depicted here in the Proposal provide a standard set of conditions for the adoption of new exceptions that contribute to the equilibrium described in the previous paragraph, as they would only be adopted when proportionate, ensuring digital euro users appropriate access to a means of payment that satisfies their needs.

2.5 Interaction between the digital euro and euro banknotes and coins – Article 12 Proposal

Article 12, point 1, together with Article 7, point 1,[141] provides one of the most important asseverations made throughout the entire Proposal: the digital euro shall be convertible with euro banknotes and coins at par.[142] With the exception of the limits posed to the

[136] See Recital (19) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[137] *Id*.
[138] The European legislator is encouraged to consider including an adequate definition in Article 2 ("*Definitions*") of the Proposal or in any of the recitals for clarity.
[139] On the other hand, since Article 10 of the Proposal is only enabling a process to adopt new exceptions to complement the content of the Proposal, a general reference could satisfy the needs at this time. However, given that this language is only used in the present legal text, some clarity in the concept would be desirable in any case.
[140] See *supra* note 54.
[141] See *supra* note 61.
[142] See *supra* note 74.

principle of mandatory acceptance laid down in articles 9, 10 and 11 of the Proposal,[143] the digital euro can be equated to its physical counterpart, the euro banknotes and coins. This article contributes to ratifying the legal tender status of the digital euro, yet it raises other complex scenarios that require analysis because of the content of the rest of the provision. Thus, Article 12, point 2, of the Proposal[144] determines that Payees of a monetary debt denominated in euro shall accept payments in digital euro according to the content of the Proposal, irrespective of whether they accept payments in euro banknotes and coins.[145] Considering the disparity in the content present in each of the provisions, this section analyses them separately, before considering an additional matter that involves the interaction between the digital euro and euro banknotes and coins: the particularities of mutilation and destruction of the digital manifestation of the single currency.

2.5.1 Convertibility at par between digital and physical manifestations of the single currency

As previously stated, Article 12, point 1, of the Proposal ratifies the convertibility of the digital euro with euro banknotes and coins at par.[146] The content of this provision can be linked to Articles 13, point 5,[147] and 23, point 2,[148] of the Proposal, with whom it shares implications concerning the convertibility of the digital euro. The legal tender status of the digital euro is reaffirmed in all these three provisions by qualifying its equivalence to euro banknotes and coins,[149] scriptural money and electronic money denominated in euro,[150] and between its online and offline manifestations,[151] respectively. While the content of both articles is addressed in upcoming chapters of this work,[152] the common

[143] See *supra* note 93.
[144] See article 12, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[145] See *supra* note 77.
[146] See *supra* note 74.
[147] See Article 13, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[148] See Article 23, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[149] See *supra* note 74.
[150] See *supra* note 147.
[151] See *supra* note 148.
[152] See subsections 4.2.4 "*Article 13(5) – At par with scriptural*" in Chapter 4 and 5.2.3 "*Online and offline payment transactions – Article 23 Proposal*" in Chapter 5 of the Thesis for the analysis of Articles 13 and 23, respectively.

theme for all three provisions recommends its intertwined analysis. Thus, the intention of the European legislator with all three references can be easily inferred: the digital euro is aimed at becoming a digital manifestation of the single currency, which makes it completely equivalent to any other manifestations of the euro, regardless of whether its denomination is physical, as in banknotes and coins, digital, or if it is available just for online or offline use. Consequently, the digital euro must not be considered a different entity to the single currency, but its digital manifestation, equal in every other characteristics rather than tangibility.

Despite the abstraction required to address this equivalence, the Proposal[153] and relevant authorities involved in the development and implementation of the digital euro[154] have stressed this reality before. By expressly referring to its absolute equivalence with other manifestations of the euro, with which citizens are already comfortable,[155] the Proposal is ensuring that technology is only enabling users to dispose of central bank money in its new digital form.

2.5.2 The digital euro in the context of the Proposal for a Regulation on the legal tender of euro banknotes and coins

Article 12, point 2, of the Proposal[156] [157] sets an obligation of payees of a monetary debt denominated in euro to accept payments in digital euro,[158] irrespective of whether they accept payments in euro banknotes and coins in accordance with Proposal for a Regulation on the legal tender of euro banknotes and coins.[159] The aforementioned Proposal constitutes the approach followed by the European Union to harmonising the legal tender status of the euro banknotes and coins, as well as the digital euro. Prior its

[153] See, e.g., Recital (6) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[154] See, e.g., Panetta, F., 'Central bank digital currencies: a monetary anchor for digital innovation', speech by Fabio Panetta, Member of the Executive Board of the ECB, at the Elcano Royal Institute, Madrid, 5 November 2021. Available on the ECB's website at http://www.ecb.europa.eu.

[155] See sub-section "*2 – Preferred features of a digital euro*" of the *Eurosystem report on the public consultation on a digital euro*, EUROPEAN CENTRAL BANK – EUROSYSTEM. Available at: https://www.ecb.europa.eu/pub/pdf/other/Eurosystem_report_on_the_public_consultation_on_a_digital_euro~539fa8cd8d.en.pdf. Published in April 2021. Last accessed on September 20, 2024.

[156] See *supra* note 77.

[157] See *supra* note 144.

[158] This is without prejudice to the exceptions and prohibitions laid down in Chapter III of the Proposal, discussed above.

[159] See *supra* note 77.

publishing, the legal tender status of the physical manifestation of the euro, banknotes and coins, was not explicitly recognised aside from Article 128 TFEU.[160] It is true that the Commission Recommendation on the scope and effects of, and access to the legal tender of euro banknotes and coins[161] offered a profound determination of the consequences associated to the legal tender consideration of the single currency, yet it did not constitute a valid legal act that could bind Member States. Only joined cases C-422/19 and C-423/19[162] provided a valid reference of the considerations of the legal tender status, namely mandatory acceptance, at full face value, with the power to discharge from a payment obligation, as previously seen in this chapter.[163]

The Proposal on the legal tender of euro banknotes and coins is aimed at unifying the concept of legal tender in the euro area, a much-needed action considering the above. However, two different issues may arise concerning this other Proposal of the European Commission that may impact the issuance of the digital euro. First, the provision included in Article 12, point 2, of the Proposal[164] in conditional on the prospective entry into force of the Proposal on the legal tender of euro banknotes and coins. Consequently, throwing caution into the analysis of this provision is required, because both the Proposal here at discussion and the Proposal on the legal tender of euro banknotes and coins may suffer changes in the near future, rendering these conclusions futile. Second, as it stands, there may be scenarios in which a payee may refuse the acceptance of euro banknotes pursuant to the Proposal on the legal tender of euro banknotes and coins, yet she must accept digital euro payments. In a context in which the digital euro has been designed to complement the use of euro banknotes and coins, this seems rather unreasonable. Therefore, the European legislator is encouraged to analyse in which scenarios this may happen and make amends to ensure no payee in the European Union can be forced to accept digital euro, as a legal tender means of payment, yet no its physical counterpart.

[160] See Article 128 of the Treaty on the Functioning of the European Union.
[161] See COMMISSION RECOMMENDATION of 22 March 2010 on the scope and effects of legal tender of euro banknotes and coins (2010/191/EU).
[162] See judgment of 26 January 2021 in Joined Cases C-422/19 and C-423/19, Hessischer Rundfunk, EU:C:2021:63.
[163] See *supra* note 60.
[164] See *supra* note 144.

2.5.3 Concerning mutilation or destruction of the digital euro

While not being considered as a binding legal act that may impose obligations in the Member States whose currency is the euro, Recommendation 2010/191/EU refers to destruction and mutilation of euro banknotes and coins, yet it does not prohibit it for small quantities of euro banknotes or coins[165] and calls for tolerating mutilation for artistic purposes.[166] Said Recommendations calls for the prohibition of unauthorized destruction of large quantities of euro banknotes or coins.[167] Since it lacks binding force, it is rather hard to find consequences to the destruction of large quantities of euro banknotes or coins in national law of the aforementioned Member States,[168] yet it enables a line of research for the upcoming issuance of the digital euro.

The Proposal on the legal tender of euro banknotes and coins[169] does not address the topic of mutilation or destruction of the single currency either, yet this topic may impact the digital euro. While mutilation for artistic purposes is out of the equation with a digital, intangible, asset like the digital euro, destruction is not. Specifically, offline digital euro holdings could be destroyed, accidentally or on purpose, and there is no provision in the Proposal, nor in the Proposal on the legal tender of euro banknotes and coins addressing its impact.

While it could be argued that the same lack of explicit regulation exists for commercial bank money, when considering the destruction of means of payment that enable the transaction, such as debit cards or passbooks, yet it is because the destruction of the means of payment does not eliminate the funds, just the authorisation to its access for transaction purposes. With an offline digital euro, the consequences of the destruction of the local storage device go beyond authentication, implying the destruction of the funds

[165] See point 6 of the COMMISSION RECOMMENDATION of 22 March 2010 on the scope and effects of legal tender of euro banknotes and coins (2010/191/EU). "[...] *6. Total destruction of issued notes and coins by individuals. Member States should neither prohibit nor penalise total destruction of small quantities of euro banknotes or coins by individuals. They should however prohibit unauthorized destruction of large quantities of euro banknotes or coins.*"

[166] See point 7 of the COMMISSION RECOMMENDATION of 22 March 2010 on the scope and effects of legal tender of euro banknotes and coins (2010/191/EU). "[...] *7. Mutilation of notes and coins for artistic purposes. Member States should not encourage mutilation of euro banknotes or coins for artistic purposes but should tolerate it. Such mutilated banknotes or coins should be considered as unfit for circulation.*"

[167] See *supra* note 161.

[168] See, e.g., Article 386, point 1, of Spanish Penal Code ("*Código penal*.") "*Anyone who alters currency or manufactures counterfeit currency shall be punished with a prison sentence of eight to twelve years*." This provision does not address what constitutes altering the currency and whether small quantities of altered currency should be prosecuted.

[169] See *supra* note 77.

themselves.

The apparent absence of no consequences for the destruction of banknotes and coins requires being qualified for the sake of the debate. When physical money is altered or manipulated beyond its usage against the will of its owner, civil remedies for the destruction of something owned are available in any jurisdiction. In addition to that, damages are easily determinable in this case, as long as the destroyed amount can be accounted for.[170] However, it can be inferred from the technological design given to the offline digital euro[171] that ascertaining the damages to be granted for the owner of the destroyed offline digital euro holdings is harder. While it can be inferred how much was withdrawn to be used in offline digital euro holdings transactions, the level of privacy concede to this manifestation of the digital euro makes it virtually impossible to determine how much, if any, funds were still available at the time of the destruction of the local storage device.[172] In addition to that, it must be considered the cost of determining these damages may exceed the value of the remaining offline digital euro funds,[173] which may recommend the implementation of a set rule that automatises the amount of damages to award based on the most recent information available in the digital euro settlement infrastructure.[174]

Finally, it must be pointed out that an alternative consideration of the digital euro

[170] Damages are as easy to determine as it is to prove the amount that was destroyed. The reader must throw caution to this assertion, since the determination of the standard of proof in a judicial process is rarely simple and hardly ever unanimous for the parties involved.

[171] See subsection 5.2.3 "*Online and offline payment transactions – Article 23 Proposal*" in Chapter 5 of the Thesis. While online and offline digital euro payment transactions are addressed later in this work, the analysis here presented is better placed in this chapter, despite the need for additional context.

[172] See subsection 6.7.3 "*Offline transactions and their equivalence to an ATM withdrawal*" in Chapter 6 of the Thesis. The offline digital euro has been designed to equate the level of privacy of a transaction being conducted through an automated teller machine (ATM): payment service providers, as well as the European Central Bank and the national central banks, know the amount that it has been withdrawn from the digital euro payment account to be used in offline transactions. However, since its settlement occurs directly in the local storage device, no data is processed concerning said transactions, which remain obscure for those controllers of the data. Consequently, the resulting funds in the local storage device might not be known unless the digital euro user has accessed her account through internet, reflecting the last value that exists for those funds, enabling situations of material impossibility to determine the value of the required damages in an example as the one described in that paragraph.

[173] See subsection 3.2.3.2.2.1 "*Online vs. Offline limits - Article 16(4) Proposal*" in Chapter 3 of the Thesis. The offline holding limit for the digital euro will be, by definition, lower than the overall holding limit considered in the Proposal.

[174] Considering the above, the amounts at stake are rather small. A mandate to assume the last available information on offline funds to be considered the amount of damages to be granted is proportionate to the harm suffered by the owner of the destroyed local storage device. However, an alternative approach on the data available concerning the remaining funds could be considered by the European legislator. See subsection 6.7.3.2 "*Alternative approach to anonymisation*" in Chapter 6 of the Thesis.

architecture, as considered in the previous chapter,[175] could render the destruction of the digital euro virtually impossible, yet it clashes with the current design of the digital manifestation of the single currency, which seems rather invariable considering the language of the European legislator in the Proposal.[176] In any case, A DLT settlement infrastructure for the digital euro and a different authentication method –token-based instead of account-based, as currently considered–[177] would prevent the scenarios above described, albeit requiring a trade-off in terms of ease of access for certain segments of the population. Indeed, the implementation of such technologies as part of the architecture for the digital euro may suppose the exchange of adequate control of remaining funds for offline digital euro transactions, adequately preventing the scenarios described in this subsection, for causing irreparable loss by own mistake, should the digital euro user forget its authentication method for the funds.[178] Being digital inclusion one of the key objectives of the digital euro project, the described trade-off acts as an adequate justification on the technological decisions made by the European legislator when determining the digital euro architecture to be implemented, despite the possible benefits other alternatives may suppose.[179]

[175] See subsection 1.2.2 "*Categorisation of CBDC architectures*" in Chapter 1 of the Thesis.

[176] See Recital (64) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. While the European legislator explicitly addresses the commitment of the European Union authorities involved in the establishment of the digital euro to ensure that the digital euro settlement infrastructure adapts to new technologies, including distributed ledger technology (DLT), it is unlikely to see relevant changes in the retail design of the digital euro. On the other hand, for the wholesale manifestation of the digital euro, changes in this direction are rather expectable. See, e.g., *Participants chosen to explore new technologies to settle wholesale transactions in central bank money*, EUROPEAN CENTRAL BANK – EUROSYSTEM. Available at: https://www.ecb.europa.eu/press/intro/news/html/ecb.mipnews240403.en.html. Published on April 3, 2024. Last accessed on September 21, 2024.

[177] See subsections 1.2.2.2 "*Conventional or DLT infrastructure*" and 1.2.2.3 "*Account-based or token-based*" in Chapter 1 of the Thesis.

[178] As previously seen in note 83 in Chapter 1, see, e.g., Man has two guesses to unlock bitcoin worth $240m, BBC. Accessed at: https://www.bbc.com/news/technology-55645408. Published on January 13, 2021. Last accessed on September 17, 2024. Token-based systems may cause losses associated with this scenario, which is quite usual nowadays.

[179] Since the benefits associated to alternative architectures are not absolute, and the amounts at stake are small and subject to specific scenarios, the architecture chosen for the digital euro seems to fit adequately the needs of the population, although adequate rules to prevent said scenarios, as proposed above, could complement this Proposal in any case.

Chapter 3

The digital euro as a store of value and as a means of payment

3.1 Introduction to Chapter V of the Proposal

Chapter V ("*Use of the digital euro as a store of value and as a means of payment*")[1] of the Proposal[2] supplements the contents of Chapter III ("*Legal tender*") in order to address all three functions of money as they are manifested in the digital euro. The European legislator has opted for unifying both the analysis of the digital euro as a store of value and as a means of payment because of their connected implications, as well as the length of the articles included. Thus, while Article 15 offers principles that are relevant for both of the characteristics of money, Article 16 addresses the limits to the use of the digital euro as a store of value and Article 17 focuses on considerations that impact the usability of the digital euro as a means of payment.

Consequently, the structure of this chapter is as follows: in the first section, the use of the digital euro as a store of value is addressed, including several remarks on the legal concept of store of value, the principles that govern the use of the digital euro as a store of value and the limits that the Proposal introduces to that extent. In particular, the application of holding limits, as well as the impossibility for the digital euro to bear interest are addressed as included in the Proposal. In the second section, the use of the

[1] See Chapter V ("*Use of the digital euro as a store of value and as a means of payment*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[2] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Hereinafter, "*the Proposal*."

digital euro as a means of payment is analysed through a revision of the legal concept of means of payment, the existing tension between the objective of making the digital euro free for natural persons and its mandatory acceptance, as well as the rule included in the Proposal to enable charges to merchants and inter-PSP fees that are reasonable.

3.2 The use of the digital euro as a store of value - Articles 15 and 16 Proposal

The issuance of the digital euro is characterised by the limitations it may suffer in its consideration as a store of value. While the European legislator is aware of the positive implications that the digital euro may bring to the unbanked population, considering the objectives of monetary policy of the euro area and the stability of the financial system as a whole, digital euro users will have to consider the application of holding limits and the absence of an interest-bearing characteristic in the new digital manifestation of the single currency.

In order to address the implications of the aforementioned decisions, this section is structured to, first, revisit the legal concept of store of value, after its study in the previous chapter;[3] second, analyse the principles that govern the use of the digital euro as a store of value; and, third, address the specific limits included in the Proposal, namely holding limits and the impossibility for the digital euro to bear any interest.

3.2.1 Considerations on the legal concept of store of value

In the previous chapter, the concept of store of value as an inherent social and legal characteristic of money has been introduced.[4] As described, the store of value function of money refers to its ability to preserve value over time, allowing individuals to defer consumption until a future date.[5] While the store of value characteristic is not equivalent per se to guaranteed money revalue, both manifestations are closely linked, hence its usual intertwined analysis.

In the context of the issuance of the digital euro, the European legislator has included in the Proposal limitations in the use of the new digital form of the single currency as a

[3] See subsection 2.1.2.2 "*Store of value*" in Chapter 2 of the Thesis.
[4] *Id*.
[5] See Gleeson, S. (2018). *The legal concept of money*. Oxford University Press.

store of value to prevent an undesired competition with commercial banks.[6] In particular, the Proposal imposes limits that affect the maximum amount of digital euro its users may hold and prevents the bearing of interest for the digital euro. Both design choices for the digital euro, despite being well-founded in their rationale, are subject to analysis later in this chapter, as an alternative approach would have still been possible.

3.2.2 Principles that govern the use of the digital euro as a store of value - Article 15 Proposal

Article 15, point 1, of the Proposal states that the use of the digital euro as a store of value may be subject to limits for a given set of reasons.[7] First, the Proposal states the objective of enabling users to access and use the digital euro. Second, the legal text references the goal of defining and implementing the monetary policy of the European Central Bank. Finally, there is an express reference to contributing to the stability of the financial system.[8] While the first one may come as self-explanatory, in line with the main objective of the issuance of the digital euro,[9] the other two are presented to qualify its nature as a digital means of payment and its expected relationship with the financial system as it exists at this moment. An unregulated digital euro may create an undesired competition with bank money,[10] [11] as well as it may jeopardize the stability of the financial system by twisting the monetary policy set by the European Central Bank.[12] On the other hand,

[6] See subsection 3.2.2 "*Principles that govern the use of the digital euro as a store of value - Article 15 Proposal*" in Chapter 3 of the Thesis.

[7] See article 15, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[8] *Id*.

[9] See Chapters I ("*Subject matter and definitions*") and II ("*Establishment and issuance of the digital euro*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[10] See Recitals (2), (3), (24), (37) and (49) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[11] See subsection 3.2.3.1 "*The necessity for limits - Recitals (2), (3), (24), (37), (49) and Article 16(1) Proposal*" in Chapter 3 of the Thesis.

[12] See *Monetary aggregates*, European Central Bank – Eurosystem. Retrieved from: https://www.ecb.europa.eu/stats/money_credit_banking/monetary_aggregates/html/index.en.html. Last accessed on September 4, 2024. The European Central Bank considers the digital euro part of M1 aggregate. See also *Monetary aggregate M1 reported by MFIs, central gov. and post office giro institutions in the euro area (stocks), Euro area (changing composition), Monthly*, European Central Bank – Eurosystem. Retrieved from: https://data.ecb.europa.eu/data/datasets/BSI/BSI.M.U2.Y.V.M10.X.1.U2.2300.Z01.E. Last accessed on September 4, 2024. Despite the required reduction in 2022 caused by the high inflation, M1 still accounts for more than 10,000,000 millions of euro. The impact of the digital euro in the monetary policy of the euro area is tremendous and any change must be meditated in advance accordingly.

limits are presented to ensure cooperation with private actors of the financial system[13] and to guarantee the usefulness of the digital euro in terms of monetary policy.[14]

For its part, Article 15, point 2, of the Proposal[15] points out the existing tensions between the involved parties in a digital euro payment transaction.[16] While the main goal of the European Central Bank is to ensure an effective and widespread use of the digital euro, merchants[17] [18] must face charges or fees to compensate both PSPs for the provision of digital euro payments and the maintenance of the digital euro settlement infrastructure.[19] [20] This is why the provision introduces the limitation of said charges or fees according to the methodology described later in Chapter V.[21]

The European Union authorities endeavour to make the digital euro a broadly accepted means of payment[22] so they need to make it as closely possible to “free of charge”. Otherwise, people will prefer using cash or debit cards as their preferred digital means of payment, as they are virtually free.[23] The payment infrastructure requires maintenance,

[13] While private banks have been addressed as key partners in the digital euro project, card schemes have not. This differentiation is useful to understand which private actors are expected to benefit from the issuance of the digital euro, hence enabling the analysis of the current design of the considerations included in the Proposal.

[14] See *supra* note 12. The implementation of the digital euro makes information in real time concerning the M1 aggregate available for the Eurosystem. Its implementation plays a big role in the future of the monetary policy within the European Union.

[15] See article 15, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[16] See "*Digital euro payment transaction*" in the *Glossary*.

[17] See Chapter 2 ("*The legal tender status of the digital euro*") of the Thesis. The legal tender status of the digital euro ensures its mandatory acceptance unless one of the exceptions listed in the Chapter III of the Proposal applies. Since basic digital euro payment services are free for natural persons pursuant to Article 17, point 1, of the Proposal, fees and charges are to be sustained by merchants without alternative. However, this assertion is qualified later in this chapter.

[18] Natural persons may also sustain charges or fees to be paid to PSPs according to article 15, point 2, of the Proposal. However basic digital euro payment services are guaranteed to be free for natural persons pursuant to Article 17, point 1, of the Proposal. A proper reference would have been adequate to ensure the reader understand that this reference does not addresses basic services for natural persons, to which merchants do sustain charges or fees.

[19] It is said, however, in Recital (41) of the Proposal that the European Central Bank and the Eurosystem will not charge PSPs for the costs derived from the provision of digital euro services to digital euro users. While this may be true, the cost of maintenance must be covered.

[20] No information whatsoever is provided by the European Central Bank concerning the real cost of maintenance of the digital euro settlement infrastructure.

[21] See article 17, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[22] See Chapter 2 ("*The legal tender status of the digital euro*") of the Thesis. In fact, the Proposal makes its acceptance mandatory pursuant to Article 7, point 2, with the exception of the content of Articles 8 to 11 in Chapter III of the Proposal.

[23] Comparable means of payment to the digital euro, such as debit cards, entail for most citizens of the European Union no cost at all. However, they entail a worse alternative than the digital euro in terms of privacy, acceptance, and inclusion of those in need of financial and digital assistance, hence the need for a public digital means of payment such as the digital euro.

which equals “costs.” Consequently, the European legislator must ensure the satisfaction of users, who wish not to face any costs, of merchants, who would only be attracted if the new system brings lower costs, and of PSPs, who require enough revenue to not bear any losses when processing payments. The digital euro, as designed in the Proposal, satisfies all relevant parties involved like this, as it will be addressed later in the Chapter.[24]

3.2.3 Limits to the use of the digital euro as a store of value - Article 16 Proposal

A growing tension between the objectives laid down in the Proposal concerning the implementation of the digital euro and the interests of essential actors of the financial system, namely large credit institutions, has been identified throughout the Proposal. The digital euro has been identified as a public means of payment whose main objective is enable all potential users to access digital payments. For that goal, collaboration with PSPs providing services in the European Union is necessary, requiring all parties to align their interests. The imposition of holding limits for the digital euro is one of those actions oriented to ensure that the relevant institutions of the European Union and major PSPs work together in the implementation and distribution of the digital euro.

In line with the content of the previous paragraph, this subsection addresses the necessity for limits as considered in the Proposal before analysing the regulation of holding limits in Article 16, point 4, of the Proposal.

3.2.3.1 The necessity for limits - Recitals (2), (3), (24), (37), (49) and Article 16(1) Proposal

The Proposal justifies in its recitals the necessity for limits in the implementation of the digital euro. Commercial bank money[25] has been so far the only manifestation of digital funds that consumers have been able to use, which relies on its convertibility on central bank money[26] with legal tender, acting as a monetary anchor of the financial system.[27] However, the implementation of a new public digital means of payment in the form

[24] See subsection 3.3.4 "*Charges to merchants and inter-PSP fees*" in Chapter 3 of the Thesis.
[25] See "*Commercial bank money (CBM)*" in the *Glossary*.
[26] See "*Central bank money*" in the *Glossary*.
[27] See Recital (3) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

of a CBDC should not cater for the creation of an unrestricted tool, hence requiring a balance between a smooth payment experience[28] and safeguarding the financial stability of the system while ensuring the financial intermediation function can still be provided in adequate terms.[29] In addition to that, the Proposal also relies on the imposition of limits to address the specific considerations that may arise when dealing with digital euro users who are not residing or established in a Member State of the European Union whose currency is the euro.[30] [31]

The general idea that must be considered after reviewing those Recitals is that the Proposal welcomes the competition of digital euro with other equivalent private means of payment, yet there is an obviously undesired competition with bank money that requires caution. The principle of an open market economy with a free competition, in accordance with Article 127 TFEU,[32] must be respected by the European Central Bank when implementing the digital euro.[33] PSPs,[34] and namely credit institutions,[35] are strategic partners in the distribution of the digital euro,[36] which is not designed to substitute their services. Considering all this, the imposition of limits on the use of the digital euro was expected, and its imposition in this Proposal does not come as a surprise.

In addition to that rationale, there are implications of monetary policy that also justify the implementation of limits on the digital euro.[37] The digital euro can be used as an efficient instrument of monetary policy to articulate changes in the monetary aggregate M1 in real time, with proper data concerning usage. Thus, money supply can be understood on the spot and measures that directly impact the monetary policy of the euro area can

[28] See Recital (36) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[29] See Recital (37) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[30] See Recital (49) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[31] See Chapters 2 ("*The legal tender status of the digital euro*") and 4 ("*Distribution of the digital euro*") of the Thesis.

[32] See Article 127, point 1, of the Treaty on the Functioning of the European Union.

[33] See Recital (32) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[34] See Article 13 ("*Payment service providers*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[35] See Article 14 ("*Access to the digital euro in Member States whose currency is the euro*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[36] See Chapter 4 ("*Distribution of the digital euro*") of the Thesis. Tasks concerning the distribution of the digital euro have been assigned to PSPs in general, and credit institutions in particular.

[37] See *supra* note 12.

be taken.[38]

With all this in mind, Article 16 of the Proposal can be analysed.[39] Its point 1[40] acts as a framework for determining how the European Central Bank may[41] limit the use of the digital euro as a store of value and the parameters that may apply. This section also determines the active and passive considerations of the mandate: PSPs providing account servicing payment services within the meaning of Directive 2015/2366 (PSD2)[42] shall apply these limits to digital euro payment accounts to the natural and legal persons referred to in Article 13, point 1.[43] [44]

3.2.3.2 Limits in the Proposal and their application

Once justified, the Proposal addresses the instruments that shall limit the use of the digital euro as a store of value. This sub-section, which mirrors the structure presented in the Proposal, is arranged as follows: first, the parameters considered by the European Central Bank when defining the holding limits are analysed. Second, the holding limits as described in Article 16, point 4, of the Proposal are presented, paying attention to the differences that may arise for online and offline digital euro payment transactions, as well as other specific limitations considered by the Proposal.

[38] Setting a higher or a lower holding limit in the digital euro directly impacts the monetary aggregate M1. Due to its digital nature, and the availability of usage data, the European Central Bank can monitor its evolution from the beginning of the implementation of such measure.

[39] See article 16, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[40] See article 16, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[41] See point 10.4 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). The European Central Bank has criticised that the Proposal suggests that the possibility of establishing limits on the digital euro is an optional feature while imposing on the monetary authority the obligation to develop instruments to limit the use of the digital euro as a store of value, which is somehow incompatible. The European legislator is encouraged to amend the content of Article 16 of the Proposal, especially when its intention of establishing holding limits has already been addressed in the legal text.

[42] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2.)

[43] There is a mistake in article 16, point 1 of the Proposal. The original drafting refers to "Article 12(1)" ("*Interaction between the digital euro and euro banknotes and coins*") instead of "Article 13(1)" ("*Payment service providers*"), hence the correction introduced.

[44] Natural and legal persons referred to in Article 13, point 1, of the Proposal will be addressed on subsection 4.2.2 "*Digital euro users - Article 13(1) Proposal*" in Chapter 4 of the Thesis.

3.2.3.2.1 Parameters in Article 16(2) Article 16, point 2, of the Proposal references how the parameters and the instruments referred to in the previous paragraph of the Proposal shall be designed to contribute to the general objectives concerning the implementation of the digital euro.[45] Said limits shall safeguard the objectives set out in Article 15, point 1, in particular financial stability,[46] ensure the usability and acceptance of the digital euro as a legal tender instrument,[47] and respect the principle of proportionality.[48]

While the reference to the objectives set out in the first Article of Chapter V of the Proposal may seem redundant, the express reference to financial stability in letter a)[49] entails a concrete goal, because it reaffirms that monetary policy and financial stability are essential for the European Central Bank. In fact, while the main objective of the European Central Bank is price stability, its main task is to define and implement the monetary policy of the Union.[50] However, this express mention has been seen as redundant by the monetary authority itself, which considers that this mention was not necessary because it was already part of the ECB's tasks according to the Treaties.[51]

Concerning the reference to the legal tender status in letter b),[52] the European regular has determined that the parameters to be implemented must balance the tension between this letter and the previous.[53] Consequently, when defining said parameters, there must be incentives for the effective use of the digital euro as a means of payment in equal conditions to euro notes and coins, while ensuring room for adjustments due to the monetary policy of the Union and any other objectives of financial stability that may be considered.

[45] See article 16, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[46] See article 16, point 2, letter a), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[47] See article 16, point 2, letter b), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[48] See article 16, point 2, letter c), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[49] See *supra* note 45.

[50] See Article 2 ("*Objectives*") of the PROTOCOL (No 4) ON THE STATUTE OF THE EUROPEAN SYSTEM OF CENTRAL BANKS AND OF THE EUROPEAN CENTRAL BANK.

[51] See point 10.4 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). In particular, the European Central Bank "*notes that giving primacy to one of them (financial stability) may be viewed as restricting an existing core task (the definition and implementation of monetary policy) by stipulating parameters for the ECB's action, diverging from the ECB's primary mandate of price stability under the Treaty. Since the definition and implementation of monetary policy is in any case facilitated by safeguarding financial stability, the ECB does not contemplate any friction between these two tasks in setting the holding limits.*"

[52] See *supra* note 46.

[53] See *supra* note 45.

Finally, regarding the principle of proportionality as mentioned in letter c),[54] it acts as a general,[55] yet required, consideration to ensure that any parameter to be introduced must be adequately justified in its means and implications considering all sources of primary law of the European Union.

Even though the content of point 2 of Article 16 aspires to delimit adequately the development of parameters that may limit the use of the digital euro as a store of value, its content comes as bland for that purpose. All three references are wide, without specific considerations that may oblige the actions of the European Central Bank in a given direction.[56] Given the implications, a more directed set of rules could have been determined.[57]

For its part, Article 16, point 3, of the Proposal establishes that the parameters and use of the instruments introduced in that provision shall be applied in a non-discriminatory manner and uniformly across the euro area.[58] The euro area operates under the single currency, the euro, and consequently there is only one, unified, monetary policy for the Member States whose currency is the euro. Bearing this in mind, the digital euro shall be limited evenly across the euro area for two main reasons. First, it is required to ensure uniform results on its implementation. Second, to avoid discrimination between citizens of Member States belonging to the euro zone.[59] However, it could be argued that this reasoning also presents flaws, as the economic incentives needed to implement and use the digital euro are not the same in all the euro area despite the closeness in economic terms of all Member States.[60]

3.2.3.2.2 Holding limits in Article 16(4) Considering that holding limits that impact the use of the digital euro as a store of value are set to be implemented from the first

[54] See *supra* note 48.

[55] The Proposal mentions the principle of proportionality in Recitals (32) and (84), as well as in Articles 9 and 17, in the same fashion as it does in Article 16.

[56] See *supra* note 51.

[57] This critique is shared with the content of Article 17, point 5, of the Proposal. See subsection 3.3.4.2.2 "*Methodology in Article 17(5) Proposal*" below.

[58] See article 16, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[59] See subsection 4.4.1.2 "*Same limits consideration – Article 18(4)*" in Chapter 4 of the Thesis. When considering the distribution of the digital euro in Member States whose currency is the euro, this rule also applies and holding limits must be adequately homogenised because of a similar rationale.

[60] See section 2.4 "*Limitations to the principle of mandatory acceptance*" in Chapter 2 of the Thesis. Considering a, e.g., 3000€ holding limit may have different implications for the population of Germany and Greece, for instance. While the rationale can be adequately justified, the European legislator is encouraged to review its strategy for the implementation.

issuance, despite the occasionally confusing language in the Proposal,[61] the analysis of points 4 to 7 of Article 16 of the Proposal becomes vital. This sub-section addresses the different categories of holding limits that the Proposal includes, specific limitations that apply to different categories of digital euro users pursuant to Article 13, and other limitations that may arise for digital euro users who hold multiple accounts or accounts that are owned by multiple digital euro users.

3.2.3.2.2.1 Online vs. Offline limits - Article 16(4) Proposal Article 16, point 4, of the Proposal[62] states that any holding limits that are determined shall apply to both offline and online holdings. Said article offers the rules to determine the limits[63] that apply to holdings of a given user, considering different scenarios that are analysed separately below.

The European legislator begins the articulation of the holding limits rule by referencing the overall holding limit[64] determined by the European Central Bank. Once established, the Proposal references the existence of a holding limit for offline digital euro,[65] as well as a holding limit for online digital euro.[66] The relationship between all three categories is determined as follows by the Proposal:

$$\text{Online holding limit} = \text{Overall holding limit} - \text{Offline holding limit}$$

$$Where \text{ Offline holding limit} \in [0, \text{Holding limit set pursuant with Article 37}]$$

The proposed limits scheme is presented using a rather confusing structure, challenging the reader to understand the limits despite the simplicity of the measure. The overall holding limit is defined by the European Central Bank as part of the measures that must implement pursuant to Article 16, point 1 of the Proposal.[67] For its part, the offline holding limit can be set by the digital euro user at any amount between zero and

[61] See *supra* note 41.

[62] See article 16, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[63] The naming convention used by the European Commission for the each of the limits considered in this Article is confusing, and no specific reference to any of the limits is made in Article 2 ("*Definitions*") of the Proposal. The European legislator is encouraged to correct the situation and improve the Proposal by defining adequately each of the holding limits considered. In the meantime, this Thesis addresses each category and provide a definition where required.

[64] See "*Overall holding limit*" in the *Glossary*.

[65] See "*Offline holding limit*" in the *Glossary*.

[66] See "*Online holding limit*" in the *Glossary*.

[67] See *supra* note 40.

the holding limit that the European Commission may set in accordance with Article 37, point 5,[68] in connection with Article 39, point 2, of the Proposal.[69] Finally, the online holding limit is the difference between the overall holding limit and the offline holding limit, if set to any amount different to zero by the digital euro user.[70]

Concerning the offline holding limit as defined in this article, it must be an amount lower, or equal, to the overall limit determined by the European Central Bank. However, said offline holding limit is only theoretical at this point.[71] [72] Yet, considering the content of Chapter IX ("*Anti-money laundering*") of the Proposal its implementation can be expected to match the first issuance of the digital euro.[73]

3.2.3.2.2.2 Limits pursuant to Article 13 Proposal - Article 16(5) Proposal

Article 16, point 5, of the Proposal determines that certain natural and legal persons shall be subject to limits that are not higher than the ones effectively implemented in the euro area for natural and legal persons residing or established in Member States whose currency is the euro.[74] Pursuant to Article 13, point 1, of the Proposal,[75] this provision applies to the following natural and legal persons: visitors,[76] users no longer residing or established in a Member State whose currency is the euro,[77] users residing or established

[68] See article 37 ("*Anti-money laundering rules applying to offline digital euro payment transactions*"), point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[69] See article 39 ("*Committee procedure*"), point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Said article forwards to Article 5 of Regulation (EU) No 182/2011, which comprises the examination procedure.

[70] Should the digital euro user not define an offline holding limit, the online holding limit will match the overall holding limit.

[71] The Proposal does not ensure the existence of any offline holding limit but points out to the process for the European Commission to adopt it in accordance with the European Central Bank. We can expect its implementation, but the current state of development recommends throwing caution in what refers to its analysis.

[72] Since the Proposal offers a spectrum for determining the value of the, yet, theoretical offline holding limit, it could be arguably determined to be equal to the overall holding limit even after considering the parameters and limitations discussed above concerning Article 16, point 2, of the Proposal. For instance, it could be argued that, in an extreme and dire situation for the financial system (e.g.: a war), no offline holdings could be allowed. The rambling writing employed here enables this possibility, although the usual range for this holding limit will ensure that the objectives associated to the legal tender status, namely the widespread of the digital euro as a means of payment throughout the euro area, can be met with ease.

[73] See subsection 6.7.4 "*Offline transaction and holding limits*" in Chapter 6 of the Thesis.

[74] See article 16, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[75] See article 13, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[76] See Id., letter c).

[77] See Id., letter b).

in a Member State whose currency is not the euro[78] and users residing or established in third countries.[79]

The specific consideration concerning limits that are not higher than the ones implemented for natural and legal persons in Member States whose currency is the euro requires further analysis because of its implications. Attending to the language used in the provision, lower limits can be set for the natural and legal persons described before as long as they are not discriminatory.[80]

The same article also states that the parameters and use of the instruments shall be applied in a non-discriminatory manner and uniformly across Member States whose currency is not the euro.[81] [82] Additionally, when deciding on the use of the instruments in those Member States and setting the parameters, the European Central Bank shall consult national central banks of Member States whose currency is not the euro.[83]

3.2.3.2.2.3 Limits on multiple accounts / An account owned by multiple people - Articles 16(6) and 16(7) Proposal The Proposal addresses two different scenarios that involve multiple ownership in points 6 and 7 of Article 16, each of them in connection with other provisions that enable such functionalities. Despite being regulated in Article 16, both scenarios have already been introduced previously in the Proposal.[84]

Thus, Article 16, point 6, of the Proposal[85] addresses the scenario in which a digital euro user owns multiple digital euro payment accounts. Since the individual holding limit applies to the natural or legal person, not to the account itself, the Proposal determines that the user must define the allocation for each digital euro payment account in advance,[86] so

[78] See Id., letter d).

[79] See Id., letter e).

[80] See *supra* note 60 for an introduction in this debate. The rationale for this possibility is not as clear, as this provision seems to break the balance set in this very Article for the Member States whose currency is the euro. As previously stated, the European legislator is encouraged to review its strategy for the implementation of the digital euro or to address explicitly the objective pursued.

[81] See *supra* note 74.

[82] Uniform holding limits for Member States within the euro area may come as challenging, as discussed in *supra* note 60, yet uniform holding limits for the rest of the Member States whose currency is not the euro is even trickier to come by. The differences in cash limit usage for the different Member States of the European Union anticipates this. See *infra* note 101.

[83] See *supra* note 74.

[84] See Article 13, point 7, for owners of multiple accounts, and Recital (39) of the Proposal for accounts owner by multiple digital euro users.

[85] See article 16, point 6, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[86] The Proposal does not address the time for this individual allocation, nor describes whether the allocation can be changed at a different point in time, although it can be inferred that the user will be able to update it with immediate result in the digital euro settlement infrastructure.

the sum of all holdings can never be higher than the overall holding limit determined in the previous point of the Article.[87] Accordingly, the PSPs involved[88] only need to perform checks to ensure that the user never goes beyond the limit set, which guarantees the holding limit is not violated. Only in the event of misalignment or malfunction in the digital euro settlement infrastructure this could be altered contrary to this provision.[89]

For its part, article 16, point 7, of the Proposal[90] analyses the scenario in which a digital euro payment account is held by more than one digital euro user. The main consequence is that the holding limit that applies to that account amounts to the sum of the individual holding limits allocated to its users.[91] It must be considered that the language used by the Proposal ("the sum of the individual holding limits allocated to its users") is not trivial. Since individual holding limits may be restricted pursuant to Articles 13,[92] 29,[93] and 37[94] of the Proposal, different users may be subject to different holding limits. However, the language in the clause may enable the opposite situation to the one desired. Although the purpose of this provision is to minimise unlawful uses of digital euro payment accounts by users whose access has been limited, the holding limit to be controlled by PSPs is said to be equal to "the sum of the individual holding limits" of each of the users who hold the account. Thus, a digital euro user whose holding limit has been limited will be able to perform transactions using the totality of the holdings available in the jointly-owned digital euro account, which, by definition, will be a greater amount to what is legally entitled to. Therefore, this provision should impose the obligation to review how much is each digital euro user contributing with to the existing holdings in

[87] See *supra* note 62.

[88] A digital euro user may hold two or more digital euro payment accounts with either the same PSP or with different ones, pursuant to Article 13, point 7, of the Proposal.

[89] See subsections 5.3.6 "*Settlement of digital euro payment transactions – Article 30 Proposal*" in Chapter 5 and 6.5.3 "*Single access point*" in Chapter 6 of the Thesis.

[90] See article 16, point 7, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[91] *Id*.

[92] See Article 13, point 1, second paragraph, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Natural and legal persons who opened a digital euro account at the time they resided or were established in the Member States whose currency is the euro, but no longer reside or are established in such Member States and visitors may have temporary restricted access to the digital euro services.

[93] See Article 29 of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Digital euro users may be listed persons or entities pursuant to Union sanctions adopted in accordance with Article 215 TFEU.

[94] See Article 37, points 5 and 6, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. The European Commission is empowered to adopt implementing acts setting offline digital euro payment transaction limits and holding limits.

the account. Otherwise, sanctions and limitations may be escaped using joint accounts.[95]

Additionally, it must be said that the Proposal does not address for either of the previous scenarios the differences that may apply for offline digital euro payment accounts. Based on the description provided in Article 16, point 4, of the Proposal,[96] it may be inferred that the same considerations apply to the offline holding limits, with its specificities concerning how the allocation may work.[97]

3.2.3.2.2.4 Critique on the limits scheme As previously analysed, the necessity for a holding limits scheme has been adequately addressed in the Proposal.[98] However, the Proposal cannot escape criticism on some of the choices made because of the impact they could have once the digital euro is issued.

First, the likely existence of holding limits for the digital euro is only addressed from the perspective of the geographical location of the digital euro users, yet no differences are considered between natural and legal persons. No provision in the Proposal makes possible to infer that holding limits will be different for natural and legal persons, despite the fact that the specific necessities of each party are different and a common holding limit for both may act as an appropriate incentive for one, yet be terrible for the other.[99] The European legislator is encouraged to address these circumstances to provide a solution that may consider differentiating limits for natural and legal persons, otherwise alternative

[95] See Recital (39) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. The European legislator includes a non-binding rule in it that considers possible circumvention of the holding limits, yet in a different scenario: *"Where a digital euro payment account is legally held by only one digital euro user, but can be technically accessed to and used by several persons, upon de facto or legal mandate given by the digital euro user, any holding limit applied to the digital euro payment account should remain equal to the holding limit defined for a digital euro payment account held by a single digital euro user, to avoid any circumvention of the holding limits."* It is surprising, then, that no action has been taken to prevent the circumvention of holding limits as described above, despite the awareness on the topic.

[96] See *supra* note 62.

[97] See subsection 5.2.3 "*Online and offline payment transactions – Article 23 Proposal*" in Chapter 5 of the Thesis. Nowhere in the Proposal it is said that digital euro users cannot hold offline digital euro in different devices they own, hence it may be possible. However, this may become problematic in terms of settlement of digital euro payment transactions and security. In particular, this may become impractical for digital euro users with limited internet access that share a digital euro payment account (e.g.: families with more than one payment device who rely on offline digital euro for proximity payments.) The European legislator is encouraged to conduct an in-depth analysis of special cases of use such as this to ensure the final design of the digital euro does not neglect specific sectors of the population.

[98] See subsection 3.2.3.1 "*The necessity for limits - Recitals (2), (3), (24), (37), (49) and Article 16(1) Proposal*˝ in Chapter 3 of the Thesis.

[99] See subsection 4.2.3.3 "*Waterfall and reverse-waterfall functionalities - Article 13(4)*" in Chapter 4 of the Thesis.

methods may be exploited by digital euro users.[100]

Additionally, and in line with ideas that have already been introduced in this text,[101] cash limits in the European Union are not uniform,[102] which may forecast difficulties when providing incentives that work the same for all Member States in the euro zone. Despite the introduction of a common limit of 10,000€ for cash transactions in the European Union,[103] most Member States whose currency is the euro have already implemented stricter limits,[104] deeming this provision futile for them. Consequently, the implementation of a common holding limit for said Member States may enable the debate on whether it is a measure to incentivise the use of the digital euro or to coerce the citizens of the euro area to use a more controlled[105] means of payment.

[100] See subsection 3.2.3.2.2.3 "*Limits on multiple accounts / An account owned by multiple people - Articles 16(6) and 16(7) Proposal*" above. A small business may consider opening a digital euro payment account that is owned by multiple people, avoiding the uniform limit for both natural and legal persons. This scenario is unintended and preventable, hence the need for additional considerations.

[101] See subsections 3.2.3.2.2 "*Holding limits in Article 16(4)*" and 3.2.3.2.2.2 "*Limits pursuant to Article 13 Proposal - Article 16(5) Proposal*" above.

[102] See *Cash payment: Cash limits in Europe*, European Consumer Centre Germany. Available at: https://www.evz.de/en/shopping-internet/cash-payment-limitations.html. Published on June 14, 2024. Last accessed on September 16, 2024.

[103] See Article 15 ("*Application of customer due diligence*"), point 1, letter (b), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing. COM/2021/420 final. The Proposal allows Member States to introduce stricter measures, which is already the case, see *infra* note 104.

[104] See *supra* note 102. Belgium, Croatia, France, Germany, Greece, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia and Spain have implemented limits to cash payments, albeit disperse: from 500€ in Greece to 10.000€ in Germany or the Netherlands, in line with the Proposal on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing.

[105] See subsection 6.7.3 "*Offline transactions and their equivalence to an ATM withdrawal*" in Chapter 6 of the Thesis. It could be argued, however, that offline digital euro transactions would have a similar level of anonymisation as cash payment transactions. That would allow us to consider that this is, in fact, an improvement should the limit stay over the ones already existing in Member States for cash payments. Should the limit be equal to that one, in fact harmonising this limitation throughout all Member States whose currency is the euro, it could not be understood as an incentive, but as a coercive measure against anonymous payments in the European Union. At this point of development of the digital euro, we lack relevant information to assert any definitive assertion on this topic. A deeper analysis could be performed when the European Central Bank and the European Commission determine the holding limits for both online and offline digital euro payment transactions.

3.2.3.3 *The digital euro shall not bear interest* – Article 16(8) Proposal

In alignment with the architecture and final design chosen for the digital euro,[106] Article 16, point 8, of the Proposal[107] states that, within the framework of this Regulation, the digital euro shall not bear interest.

3.2.3.3.1 Effects This choice in the final design of the digital euro was completely expected, as the incentives that arise from the imposition of holding limits are opposite to those that may be enabled from the bearing of interest from holdings. The digital euro is not meant to compete with bank deposits, as it has been envisioned as a public digital means of payment whose use as a store of value is limited pursuant to the content of Chapter V of the Proposal.[108] Further, the digital euro is not meant to compete with payment accounts[109] nor private commercial banks in general.[110] The digital euro is aimed at providing an accessible and free digital means of payment, and only card schemes have been identified as direct competition by the European Central Bank.[111] [112] [113] This idea is what glues the Proposal together and that is why it makes perfect sense, although it can be seen as a lost opportunity of providing an improved and public service of financial intermediation to the citizens of the European Union.[114]

[106] See subsection 1.2.2.3 "*Account-based or token-based*" in Chapter 1 of the Thesis. An account-based CBDC that seeks cooperation with private banks instead of confrontation could only be designed to disallow the bearing of interest for its users.

[107] See article 16, point 8, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[108] See Recital (37) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[109] Overlapping, however, may exist. See subsection 4.3.2 "*Overlapping between this Proposal and Directive (EU) 2014/92 – Article 14(2)*" in Chapter 4 of the Thesis.

[110] See subsection 3.2.3.1 "*The necessity for limits - Recitals (2), (3), (24), (37), (49) and Article 16(1) Proposal*˝ in Chapter 3 of the Thesis.

[111] See subsection 3.3.4.1 "*Incentives that apply*" below.

[112] See *supra* note 13.

[113] See, e.g., point 8.7 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). The European Central Bank has focused on the immense leverage that card schemes hold against users in general and merchants in particular, as they are usually the ones facing their fees. The payment system that is born with the digital euro disregards card schemes, as they are no longer the owners of the settlement infrastructure.

[114] Financial intermediation is essential for the population, yet it is provided by private actors who, despite belonging to a highly regulated sector, do not always align their own interests with those of the population. In search of adequate competition while ensuring the main objective of the financial intermediation is fulfilled, allowing the digital euro to bear interest, even though when holding limits still apply, could have initiated a valuable change in the financial sector.

3.2.3.3.2 Alternative approach in the legal academia The legal academia has drawn its attention to the potential implications of an interest-bearing CBDC, as this new digital manifestation of central bank money can be constructed to carry an interest rate, offering the monetary authorities in charge of its issuance a new tool for monetary policy.[115] By relying on the capabilities of the CBDC, the central bank could acquire a new instrument for the transmission of the monetary policy, effectively preventing the need for financial intermediaries,[116] and improving the direct control of the monetary authority over the implementation of a given policy when considering a retail CBDC.

Many design options concerning the interest-bearing capability of a CBDC could be considered, tailor-made for every monetary scenario: from positive or negative interest, at a fixed or variable rate,[117] to a two-tiered system that automatically stimulated the holdings of CBDC to a concrete, optimal, amount and then prevents the rest of the holdings from bearing any additional interest,[118] or even considering an auction mechanism that only enables remuneration during certain periods of time.[119]

Despite the reasonable concern of the European Union authorities of an interest-bearing digital euro would generate unwanted competition with commercial banks, different authors have provided sufficient evidences that support the idea that, under adequate control and a duly defined legal framework, this capability of the digital manifestation of the single currency could entail benefits for both the financial system and the prospective users of the digital euro, as well as improving the ability of the European Central Bank to influence, in real time,[120] in the monetary policy of the euro area. While the European legislator is encouraged to reconsider this decision, the language in the Proposal foresees that it is unlikely to change its opinion.[121]

[115] See Lastra, R.M. & Dietz, S. (2021). Central Bank Digital Currencies. *Journal of International Banking and Financial Law (UK)*.

[116] See Lastra, R. M., & Allen, J. G. (2018). Virtual currencies in the Eurosystem: challenges ahead. *Monetary Dialogue*.

[117] See Lastra, R.M. & Dietz, S. (2021), *supra* note 115.

[118] See Bindseil, U. (2020). Tiered CBDC and the financial system. *Available at SSRN*: https://ssrn.com/abstract=3513422.

[119] See Bofinger, P., & Haas, T. (2020). *CBDC: A systemic perspective* (No. 101). WEP-Würzburg Economic Papers.

[120] See subsection 1.2.3 "*Benefits and cases of use for a CBDC*" in Chapter 1 of the Thesis.

[121] See *supra* note 107. Article 16, point 8, of the Proposal clearly established that "within the framework of this Regulation, the digital euro shall not bear interest." While this could be up for changes in the future, should the economic and financial scenario that the European Union might be facing recommend it, the European legislator establishes a clear mandate that contrasts with other conditional implementations of possible characteristics of the digital euro, as seen throughout the Proposal. The language in this provision foresees the difficulty for the future implementation of interest-bearing capabilities in the digital euro.

3.3 The use of the digital euro as a means of payment - Articles 15 and 17 Proposal

The digital euro has been conceived as a public digital means of payment.[122] The growing tension reflected in the overlapping capabilities of the digital euro and other commercial banks' solutions[123] is ratified in Article 15, point 1, of the Proposal in what refers to the use of the digital euro as a store of value.[124] Concerning its use as a means of payment, it is Article 15, point 2, of the Proposal the one introducing limits to ensure an effective use of the digital euro as a legal tender means of payment.[125] In particular, said article introduces limits to the level of charges or fees to be paid by natural persons or merchants to PSPs, or between PSPs.[126] These considerations are detailed later in Article 17 of the Proposal.[127]

This section is structured as follows: first, the legal concept of means of payment is revisited. Second, the existing tension between the mandatory acceptance of the digital euro and its prospected use at no charge by natural persons within the euro area is addressed, focusing on the basic services that are required to be provided for free. Finally, the rules concerning the charges to merchants and inter-PSP fees that will apply to digital euro payment transactions are analysed, focusing on the methodology introduced in the Proposal to ensure fees are reduced over time while ensuring adequate compensation to the PSPs.

[122] See point 1 ("*CONTEXT OF THE PROPOSAL – Reasons for and objectives of the proposal*") of the Explanatory Memorandum that accompanies the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[123] Namely, it has been discussed in the previous subsection that the digital euro is not meant to compete with bank deposit, hence the absence of interest-bearing as a characteristic. Additionally, in subsection 4.3.2 "*Overlapping between this Proposal and Directive (EU) 2014/92 – Article 14(2)*" in Chapter 4 of the Thesis we have addressed the possible overlapping with bank accounts with basic features, as defined in Article 17 ("*Characteristics of a payment account with basic features*") of Directive 2014/92/EU (Payment Accounts Directive).

[124] See *supra* note 3.

[125] See *supra* note 15.

[126] *Id*.

[127] See Article 17 ("*Fees on digital euro payment services*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. It must be said that Article 17 of the Proposal expands Article 15, point 2, in what refers to the use of the digital euro as a store of value, the same Article 16 expands Article 15, point 1, in what refers to its use as a means of payment.

3.3.1 Considerations on the concept of means of payment

In the previous chapter, the concept of means of exchange[128] as a basic characteristic of money has been addressed and analysed.[129] As described, the means of exchange function has been considered as an inherent characteristic of money, as it enables the trade of good and services among individuals and businesses, eliminating the inefficiencies of barter.[130]

The digital euro has been conceived as a digital counterpart of the physical euro. As a complement to euro banknotes and coins, the digital euro has been designed to act as a public digital means of payment, providing the citizens with support for transactions in which cash is not suitable. Before its issuance, consumers are being forced to employ private alternatives, which are not usually free of charge or require a formal contractual link with a payment service provider.[131]

Despite its utility, the implementation of the digital euro as a public digital means of payment is subject to certain limits that aim at balancing the growing tension between its mandatory acceptance, as analysed in the previous chapter,[132] and the guarantee of free use by citizens of the European Union. The rest of the chapter analyses the measures taken by the European legislator in the Proposal to ensure an adequate compensation for PSPs that would not hamper the acceptance of the digital euro among consumers and merchants.

3.3.2 Tension: *mandatory* acceptance vs. free use by the citizenry

As it has been addressed in the previous chapter,[133] the legal tender status of the digital euro requires mandatory acceptance, hence its proclamation in Article 7, point 2, of

[128] "Means of exchange" can be equated to "means of payment" at this level of the analysis.
[129] See subsection 2.1.2.3 "*Medium of exchange*" in Chapter 2 of the Thesis.
[130] See Gleeson, S. (2018), *supra* note 5.
[131] See section 3.2 ("*Review of payment habits and preferences*") of *Study on New Digital Payment Methods*, KANTAR PUBLIC, COMMISSIONED BY THE EUROPEAN CENTRAL BANK. Available at: https://www.ecb.europa.eu/euro/digital_euro/timeline/profuse/shared/pdf/ecb.dedocs220330_report.en.pdf. Published on March 2022. Last accessed on September 19, 2024. Most citizens in the European Union use debit and credit cards for e-commerce, requiring a contractual link with commercial banks and card schemes like, e.g., VISA or MasterCard. While other alternatives may be available at a lower cost (e.g.: PayPal), the current digital payments landscape lacks interoperability, as not every PSP can ensure payments in every existing payment gateway. An universal and interoperable digital means of payment is required.
[132] See section 2.3 "*Legal tender status of the digital euro – Article 7 Proposal*" in Chapter 2 of the Thesis.
[133] See Chapter 2 ("*The legal tender status of the digital euro*") of the Thesis.

the Proposal.[134] [135] Article 17 delves into the misaligned objectives of the different participants of a digital euro payment transaction.[136] Indeed, there is an obvious tension between the involved parties, as it has been addressed before in this Chapter.[137] While the European Union authorities long for the digital euro to become a broadly accepted means of payment, regulatory incentives are needed to address this goal aligning the interests of payers, payees and payment service providers. The digital euro has been designed to function as a free[138] means of payment that guarantees minimal charges and fees to merchants and PSPs.[139] While this design is not without its critics,[140] the incentive system it creates achieves the aforementioned objectives, as it will be addressed in the following sub-sections of this chapter.

Thus, by way of a summary of the next sub-sections of this chapter, the structure of interactions that the Proposal introduces in Article 17 can be reduced to the following outline: natural persons[141] bear no cost when accessing basic digital euro payment services;[142] merchants and PSPs can only be charged for the merchant service charge and the inter-PSP fee, respectively;[143] the merchant service charge and the inter-PSP fee are subject to the methodology described in Article 17, point 5, of the Proposal[144] which creates an incentive to lower the costs over time.[145]

[134] See Article 7, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[135] This asseveration is qualified in Articles 8 to 11 of the Proposal, as addressed in Chapter 3 of the Thesis.

[136] See *supra* note 114.

[137] See the closing paragraph of subsection 3.2.2 "*Principles that govern the use of the digital euro as a store of value - Article 15 Proposal*" above.

[138] Free for natural persons in what respect to basic digital euro services as referred to in Annex II of the Proposal, pursuant to Article 17, point 1. See subsection 3.3.3 "*Free for natural persons on basic digital euro payment services - Article 17(1) and Annex II Proposal*" below.

[139] See subsection 3.3.4 "*Charges to merchants and inter-PSP fees*" below.

[140] See, e.g., subsection 3.3.4.2.2 "*Methodology in Article 17(5) Proposal*" below.

[141] Pursuant to Article 17, point 1, of the Proposal, “natural persons” refers to points (a), (b) and (c) of Article 13, point 1. Those points refer to natural persons residing in the Member States whose currency is the euro, natural persons who opened a digital euro account at the time they resided in the Member States whose currency is the euro, but no longer reside in such Member States, and visitors, respectively.

[142] See "*Basic digital euro payment services*" in the *Glossary*.

[143] See Article 17, point 6, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[144] See Article 17, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[145] See subsection 3.3.4.2 "*Rule for determining charges and fees*" below.

3.3.3 Free for natural persons on basic digital euro payment services - Article 17(1) and Annex II Proposal

Article 17, point 1, of the Proposal[146] sets out the obligation for PSPs to provide the basic digital euro payment services referred to in Annex II[147] of the Proposal without any charge to natural persons under certain conditions. The language in this provision requires further analysis concerning the beneficiaries of the obligation laid down, as well as the nature of the digital euro services that are guaranteed to be provided for free.

Point 1 of Article 17 expressly references "*natural persons as referred to in Article 13, point 1, points (a), (b) and (c)*"[148] which enables the provision of the basic digital euro payment services to natural persons residing in the Member States whose currency is the euro, natural persons who opened a digital euro account at the time they resided in the Member States whose currency is the euro, but no longer reside in such Member States, and visitors, respectively.[149] *Sensu contrario*, legal persons can be subject to fees,[150] which seems to be in line with the objectives of the European Union authorities when issuing the digital euro.[151] However, considering this in connection with the existence of common holding limits for both natural and legal persons,[152] this could become an issue to adequate incentives for legal persons to adopt the digital euro.[153] The relevant authorities involved in the digital euro project, in particular the European Central Bank, should

[146] See article 17, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[147] Annex II ("*Basic digital euro payment services*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[148] See *supra* note 141.

[149] *Id*.

[150] The natural persons described in letters d) ("natural and legal persons residing or established in Member States whose currency is not the euro, subject to the conditions laid down in Article 18") and e) ("natural and legal persons residing or established in third countries, including territories under a monetary agreement with the Union, subject to the conditions laid down in Articles 19 and 20") of Article 13, point 1, of the Proposal could technically be subject to fees also, due to the language used in Article 17. However, since the distribution to digital users in Member States whose currency is not the euro and other third countries is subject to the conditions laid down in Articles 18, 19 and 20 of the Proposal, it is reasonable to believe that any arrangement or agreement between the European Union and any of those territories will include a provision that ensures the free provision of basic digital euro payment services in tantamount conditions to those of Article 17 of the Proposal.

[151] See, e.g., Recitals (30) and (40) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[152] See subsection 3.3.2 "*Tension: mandatory acceptance vs. free use by the citizenry*" above.

[153] Mandatory acceptance is ensured under the rules, and limitations, of Chapter III of the Proposal. However, the whole disposition is designed to maximise the incentives that attract potential users to the adoption of the digital euro. It feels out of place to avoid the implementation of incentives for legal persons, considering their importance in commerce.

address these circumstances and offer an appropriate response to align the interests of all parties involved.

Annex II enumerates the list of basic digital euro services that are guaranteed to be free for natural persons.[154] In particular, basic digital euro payment services shall consist of: opening, holding and closing of a digital euro payment account;[155] consulting balances and transactions;[156] non-automated funding and defunding from a non-digital euro payment account;[157] [158] funding and defunding from/into cash;[159] initiation and reception of digital euro payment transactions by means of an electronic payment instrument;[160] [161] digital euro payment transactions referred to in Article 13, point 4,[162] [163] and provision of at least one electronic payment instrument for the execution of digital euro payment transactions.[164] The list of services included makes it reasonable to reconsider whether the digital euro is not designed to function in a similar fashion to a basic payment account,[165] because of how extensive it is. In addition to that, the explicit reference in Annex I of the Proposal to additional digital euro payment services on top of the basic services here listed would require reviewing how balanced it is for all parties involved.[166] [167]

[154] See *supra* note 147.
[155] See *supra* note 147, letter a).
[156] See *supra* note 147, letter b).
[157] See *supra* note 147, letter c).
[158] But see point 9.7 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). As understood by the monetary authority, the current language in Annex II to the Proposal does not ensure that digital euro users may access at no cost the automated funding and defunding functionalities, encouraging the European legislator to consider a change.
[159] See *supra* note 147, letter d).
[160] See *supra* note 147, letter e).
[161] To the exclusion of conditional digital euro payment transactions other than standing orders, in the following use cases: person-to-person people digital euro payment transactions; point-of-interaction digital euro payment transactions, including point-of-sale and e-commerce; government-to-person and person-to-government digital euro payment transactions.
[162] See *supra* note 147, letter f).
[163] See *supra* note 158.
[164] See *supra* note 147, letter g).
[165] See *supra* note 123.
[166] See Annex I, letter e) to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[167] Since basic digital euro payment services must be provided for free, PSPs can only make a profit out of additional digital euro services. However, the list provided for basic services is extensive and there are pressures to increase it further, see *supra* note 158. The European legislator must ensure that there is adequacy in the imposition of a list of free services, otherwise the principles of proportionality and of an open market economy might be at stake, putting those operators in a great disadvantage when offering their own comparable means of payment.

3.3.4 Charges to merchants and inter-PSP fees

Points 2 to 6 of Article 17 of the Proposal focus fees experienced by merchants and PSPs and the incentives system that apply to reduce them over time. In particular, point 2[168] determines that any merchant service charge[169] or inter-PSP fee[170] in relation to digital euro payment transactions shall comply with the principle of proportionality, and it shall not exceed the lowest of two alternative amounts: the relevant costs incurred by PSP including a reasonable margin of profit, or the fees or charges requested for comparable digital means of payment.[171]

In order to address the content of this provision, this sub-section is structured as follows: first, the incentives that apply when determining fees to merchants and PSPs are addressed. Second, the rule provided by the Proposal in Article 17, point 2,[172] is analysed focusing on the methodology that must be applied to calculate the relevant amounts. Third, the monitoring system to be implemented by the European Central Bank is examined in light of the content of the Proposal. Finally, fourth, the limitations that apply to charges and fees are described and commented.

3.3.4.1 Incentives that apply

Despite addressing the limits on the digital euro's use as a store of value, Recital (32) of the Proposal[173] is also helpful to provide context on this topic. Indeed, the European Central Bank is required to respect the principle of an open market economy with free competition, in accordance with Article 127, point 1, TFEU,[174] which establishes said principle in connection with Article 119 TFEU.[175] Likewise, said article refers to the purposes set out in Article 3 TEU,[176] which lays down the obligation of the EU institutions to ensure that a highly competitive social market economy is available for all citizens and operators offering services within the European Union. In this context, the European

[168] See article 17, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[169] See "*Merchant service charge*" in the *Glossary*.
[170] See "*Inter-PSP fee*" in the *Glossary*.
[171] See "*Comparable means of payment*" in the *Glossary*.
[172] See *supra* note 168.
[173] See Recital (32) to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[174] See Article 127, point 1, of the Treaty on the Functioning of the European Union.
[175] See Article 119, point 1, of the Treaty on the Functioning of the European Union.
[176] See Article 3, point 3, of the Treaty on European Union.

legislator is bounded by an explicit obligation to design an appropriate system of incentives to foster the implementation of the digital euro while ensuring all participant offerors can compete on equal terms.

Recitals (42) and (43) contribute to this direction determining the adequate decisions made by the European legislator. As stated, digital euro payment transactions should not be subject to excessive fees by PSPs, with those fees requiring objective justification as to their imposition, always within proportionate limits.[177] This is why a maximum fee is to be determined by the pertinent authority in the European Union,[178] as it should allow for free competition between intermediaries below that level, while considering the relevant costs incurred by PSPs for the provision of digital euro payment services in relation to digital euro payment transactions, which are objective elements, and may include a reasonable margin of profit.[179] In addition to that, to ensure the system is adequately design to foster the adoption of the digital euro while allowing free competition, it is important that that fees or charges are not higher than those requested for comparable private digital means of payment, as considered in Recital (44) of the Proposal.[180] And it is precisely in this Recital where the European legislator makes an important point that could be overlooked if not analysed carefully: International card schemes regulated under Regulation (EU) 2015/751,[181] national card schemes, and instant payments at the point of interaction provided by PSPs should be considered comparable means of payment to this extent.[182]

While this reference to comparable means of payment clashes with the one provided in Article 2 of the Proposal,[183] it helps underlining one inconspicuous goal of the European Union authorities when imposing these limits on charges and fees: to balance the bargaining power that international card schemes hold at this time, as they impose

[177] See Recital (42) to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[178] See *infra* note 226. The European Central Bank is required to determine these amounts pursuant to Article 16 of the Proposal, yet it lacks the power to do so. The European legislator is encouraged to revise this imposition on the monetary authority of the euro zone.

[179] See Recital (43) to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[180] See Recital (44) to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[181] Regulation (EU) 2015/751 of the European Parliament and of the Council of 29 April 2015 on interchange fees for card-based payment transactions.

[182] See *supra* note 171.

[183] See Article 2 ("*Definitions*"), point 25, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

their conditions to merchants, who are required to comply without alternative in order to accept digital payments.[184] Despite not being addressed explicitly in the Proposal, the European Central Bank has repeatedly addressed its concerns to the current dependence on international card schemes, the lack of competition they face and its consequences on fees and charges.[185] [186] In this line, while PSPs have been recurrently addressed as key collaborators in the design and implementation of the digital euro throughout the Proposal, international card schemes have been dismissed by the European Union authorities,[187] [188] evidencing that they have the most to lose from the implementation of the digital euro, as both users and PSPs could benefit from a digital payment system in which competition leads to lower charges and fees.[189]

3.3.4.2 Rule for determining charges and fees

As stated before, according to Article 17, point 2, of the Proposal[190] any merchant service charge or inter-PSP fee in relation to digital euro payment transactions shall comply with the principle of proportionality, and it shall not exceed the lowest of two alternative amounts: the relevant costs incurred by PSP including a reasonable margin of profit,[191] or

[184] See point 8.7 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).

[185] See slide 3 of *DIGITAL EURO Stocktake and next steps - Meeting of Central Bank Governors of the Center for Latin American Monetary Studies (CEMLA)*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/press/key/date/2024/html/ecb.sp240510~4a0c22ce7b.en.pdf?a5917f7cd83dc263f14bf3c7a24697b8. Published on May 10, 2024. Last accessed on September 15, 2024.

[186] See also *Innovation, integration and independence: taking the Single Euro Payments Area to the next level*. Speech by Piero Cipollone, Member of the Executive Board of the ECB, at the ECB conference on "An innovative and integrated European retail payments market." Frankfurt, 24 April 2024.

[187] See *Mastercard response to ECB public consultation on a digital euro*, MasterCard. Available at: https://www.mastercard.com/content/dam/public/mastercardcom/eu/europe-lfi/public-policy/pdfs/Mastercard_Digital_Euro.pdf. Published on January 12, 2021. Last accessed on September 15, 2024.

[188] See also *Protecting consumers is key to digital Euro*(sic) *project*, Visa Navigate. Retrieved from: https://navigate.visa.com/europe/future-of-money/protecting-consumers-is-key-to-digital-euro-project/. Published on May 2023. Last accessed on September 15, 2024.

[189] See, e.g., *Understanding interchange*, MasterCard. Retrieved from: https://www.mastercard.com/europe/en/regulatory/european-interchange.html. Last accessed on September 15, 2024. While current fees and charges do not account to unbearable amounts for merchants, the lack of competition has compromised its reduction over time. The implementation of the digital euro is set to reduce them attending to the methodology introduced in the next sub-section of the Thesis.

[190] See *supra* note 168.

[191] See Article 17, point 2, letter a) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

the fees or charges requested for comparable digital means of payment.[192] [193] Far from jeopardising the general objective of mandatory acceptance of the digital euro, the rule set out in this provision is adequately constructed to ensure that charges and fees are reduced over time. However, the methodology that must be considered for the rule to be applicable are not free from criticism, requiring a deeper analysis.

3.3.4.2.1 Why it is well designed to reduce fees in the long run Proportionality,[194] which is expressly mentioned in Article 17, point 2, of the Proposal,[195] is the essence of the rule set out to determine the amount to be paid for any merchant service charge or inter-PSP fee. In addition to that, the rule requires that any charge or fee cannot exceed the lowest of two different alternatives, which is again an impulse to reducing the costs incurred by merchants and PSPs in any digital euro payment transaction. Finally, the determination of each of the two amounts considered in letters a) and b) of point 2 also contributes to reduce costs over time.

The first of the two amounts references the relevant costs incurred by PSPs for the provision of digital euro payments, including a reasonable margin of profit.[196] Technology is deflationary by definition, as it improves efficiency in any process over time.[197] Payments technology have benefited from the introduction of newer technologies, with current digital payments being significantly faster and cheaper than its analogic counterparts.[198] By referencing the costs incurred by PSPs, in connection with the methodology

[192] See Article 17, point 2, letter b) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[193] See point 4.1 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). "*The ECB proposes to amend the definition of comparable digital means of payment to comprise all payment instruments that may be used in a digital environment where the initiation of payment takes place at the point of interaction, where the user would see their deposit account immediately debited (payments made using credit cards, which include a broader range of services bundled with the payment service, are excluded). This would include situations where credit transfers and direct debits are initiated at the point of interaction, but situations in which credit transfers and direct debits are not initiated at the point of interaction would continue to be excluded (e.g. for 'recurring payments', direct debit appears to be the best comparable digital means of payment)*."

[194] See *supra* notes 55 and 167.

[195] It can be read in Article 17, point 2, of the Proposal that "any merchant service charge or inter-PSP fee in relation to digital euro payment transactions shall comply with the principle of proportionality."

[196] See *supra* note 168.

[197] *How Technology Is Deflationary*, MEDIUM. Retrieved from: https://medium.com/0xmachina/how-technology-is-deflationary-e3790627f383. Published on May 31, 2022. Last accessed on September 5, 2024.

[198] See *The Hidden Cost of Digital Payments for Retail Payment Players*, ACI WORLDWIDE. Retrieved from: https://www.aciworldwide.com/blog/the-hidden-cost-of-digital-payments-for-retail-payment-players. Last accessed on September 5, 2024. According to this study, issuing a check may cost $3 on average, while electronic

to be applied,[199] the Proposal is ensuring that the charges and fees are meant to lower every year due to PSPs able to implement new and more efficient payment technologies. Additionally, despite the fact that the reference to "a reasonable margin of profit" may become problematic since there is no definition on what it entails, the Proposal addresses it adequately in its methodology to calculate this amount,[200] minimising possible abuses from PSPs.

The second of those amounts refers to the fees or charges requested for comparable digital means of payment.[201] The issuance of the digital euro may be seen as an attempt of the European Union to make digital payments more affordable. Should PSPs continue to charge the same to merchants, and other PSPs, as they do for comparable digital means of payment there might not be any improvement over time.[202] Nevertheless, the rule requires applying the lowest of the two amounts determined by letters a) and b) of Article 17, point 2.[203] Thus, should technology allow for cheaper transactions, as described in the previous paragraph, the second amount would never be applicable, even after a reasonable margin of profit. The consequence is obvious: there is a clear incentive to move towards lower costs.

3.3.4.2.2 Methodology in Article 17(5) Proposal Article 17, point 5, of the Proposal describes the parameters in which the methodology for the calculations of the amounts mentioned in point 2 shall be based.[204] [205] Accordingly, four different parameters are supplied: the first two reference the amount described in letter a) of point 2,[206] the third references the amount described in letter b) of point 2[207] and the fourth affects both amounts equally.

transactions can come as cheap as 30 cents.

[199] See subsection 3.3.4.2.2 "*Methodology in Article 17(5) Proposal*" below.

[200] *Id*.

[201] See *supra* note 168.

[202] Consider this as an extreme scenario which is unlikely to happen, yet useful for exemplification. Free competition guarantees that PSPs that can provide for cheaper transactions would attract new users, forcing the rest of PSPs to reduce their charges and fees.

[203] See *supra* note 168.

[204] See article 17, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[205] Article 17, point 5, of the Proposal only presents the parameters but is not a method of cost calculation in itself. It could be argued that a proper method could have been included in the Proposal and we could not rule out the idea of the European Commission including an actual method in the final text of the Directive.

[206] See *supra* note 191.

[207] See *supra* note 192.

The first of the parameters determines that the amount of inter-PSP fees and merchant service charges as referred to in Article 17, point 2, letter a) shall be based on the relevant costs[208] incurred for providing digital euro payment services by the most cost-efficient payment service providers[209] representing collectively one fourth of digital euro distributed across the euro area in a given year.[210] Said amount also must include a reasonable margin of profit, as previously constated.[211] By referencing the top 25% of most efficient PSPs, the methodology incentivises the reduction of costs over time.[212]

The second of the parameters determines that the reasonable margin of profit included in the amount described in the previous paragraph shall be calculated on the basis of the margin of profit of the payment service providers charging the lowest margin of profit representing collectively one fourth of the digital euro distributed in the euro area in a given year.[213] The rationale for incentivising a reduction of costs over time from the previous provision can be of application here too.[214]

For its part, the third of the parameters establishes that the amount of inter-PSPs fees and merchant service charges as referred to in Article 17, point 2, letter b), shall be based on a representative group of payment services providers providing comparable digital means of payment in the euro area.[215] No additional directions are provided in this provision, enabling the question of which PSPs must be considered for comparison. The European legislator is encouraged to improve this parameter or provide an adequate definition of what "a representative group" entails.[216]

Finally, the fourth parameter determines that the amounts referred to in paragraph

[208] See *infra* note 212.

[209] *Id*.

[210] See Article 17, point 5, letter a), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[211] See *supra* note 168.

[212] Consider the following model with multiple PSPs and three consecutive years: PSPs that charge a higher amount on year 1 will be forced to reduce their charges and fees on year 2 to match the lowest amounts verified by the European Central Bank, set by the top 25% of PSPs considered, hence lowering the amounts for average charges and fees. Consequently, at the beginning of year 2 we might expect equilibrium in the system but there will be incentives for some PSPs to charge lower fees to attract customers, hence reducing the value and instating a new lower value as a reference for Year 3, repeating the process and lowering costs until a minimum, set by technology, is met.

[213] See Article 17, point 5, letter b), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[214] Considering the same model as in *supra* note 212, PSPs interested in attracting new customers will voluntarily reduce their margin of profit, setting up a new equilibrium for the next year until a minimum, set by costs that technology cannot reduce any further, is met.

[215] See Article 17, point 5, letter c), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[216] See *infra* note 220.

2 shall be uniform and applied in a non-discriminatory manner across the euro area.[217] Contrary to the critique made on uniform holding limits,[218] there are no reasons that justify different amounts across the euro area, because the use of this technology supposes uniformity in costs for any participant PSP no matter its geographic presence. It may be argued, however, that those differences may exist when dealing with the distribution of the digital euro outside the euro area, either in Member States whose currency is not the euro or third countries. However, this rule is likely to be addressed independently in any arrangement or agreement to be formalised with said countries, similarly to what was considered before.[219]

The European Central Bank has expressed its concerns regarding the parameters here described.[220] Thus, the monetary authority of the euro area has manifested that some of the relevant parameters, such as a "reasonable margin of profit" and the "most cost-efficient payment service providers", are subjective notions whose interpretation depends on accounting rules, business strategies among different PSPs, different business models and areas of operation.[221] According to its words, unified definitions for those concepts are required to ensure that the methodology to be considered can generate the beneficial effects for which has been designed. Otherwise, the European Central Bank cannot guarantee that the amounts considered can be adequately reduced over time, following the incentives system analysed above.

3.3.4.3 Monitoring by the European Central Bank

To ensure the methodology described in Article 17, point 5, of the Proposal can be of application, Article 17, point 3,[222] determines that The European Central Bank shall regularly monitor the information that is relevant for the purposes of the amounts referred to in point 2 of the Article, and publish periodically the amounts resulting from that monitoring with an explanatory report.[223] In addition to that, Article 17, point 4, of

[217] See *supra* note 215.
[218] See Chapter 4 ("*Distribution of the digital euro*") of the Thesis.
[219] See *supra* note 150.
[220] See point 10.12 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).
[221] *Id*.
[222] See Article 17, point 3 of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[223] The obligation laid down in Article 17, point 3, of the Proposal is in line with the content of Article 40 ("Reports"), point 1, letter a), of the Proposal.

the Proposal determines that The European Central Bank may require payment service providers to provide all information necessary for the application of this article and to verify compliance with it, requiring that any information requested shall be sent by payment service providers within the time limit set by the European Central Bank.[224]

The proposed reporting system is appropriate for the objectives set out in Article 17, as it ensures transparency and reduction of costs in the long run, since anomalies can be detected regularly, hence deterring its appearance. However, three different difficulties arise and require additional analysis. First, the provided timeframe is not specific. While Article 17, point 5, establishes a timeframe for the analysis of "a given year,"[225] there is no specification in Article 17, point 4. While it could be understood that both timeframes should coincide, nothing in the Proposal states so, recommending a review of the content of the article. Second, the European Central Bank has drawn attention to the fact that its reporting on maximum amounts of charges and fees cannot be equated to the determination of said amounts, as it lacks the legal capacity to do so.[226] Finally, the European Central Bank has also expressed its concern regarding the reinforcement of point 4 of Article 17.[227] The Proposal imposes upon the European Central Bank the obligation to monitor the information referred to in said article, yet the monetary authority lacks robust enforcement mechanisms to ensure PSPs fulfil their reporting duties.[228] The European legislator may decide to establish an appropriate set of sanctions to be applied automatically should any PSP fail to report as requested or provide the European Central Bank with said enforcement mechanisms. In any case, changes are required in the Proposal.

3.3.4.4 Limitations on what can be charged

Finally, the last two points of Article 17 limit what PSPs may charge to merchants and to other PSPs per digital euro payment transaction. These two provisions act as a explicit

[224] See Article 17, point 4 of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[225] See *supra* notes 212 and 215.

[226] See point 10.15 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). Should the European Central Bank publish said amounts, it cannot be considered *de jure* determination. Should any affected party challenge and subject them to judicial scrutiny, an action for annulment could be granted, jeopardising the objectives associated to that publication.

[227] See point 10.11 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).

[228] *Id*.

limitation on the amounts of the merchant service charge and the inter-PSP fee that goes beyond the methodology described before in the article.

Thus, Article 17, point 6, of the Proposal determines that the merchant service charge shall be the only charge per transaction that PSPs may apply to merchants.[229] Funding and defunding operations cannot be charged to merchants under that merchant service charge, not even when waterfall and reverse waterfall functionalities apply pursuant to Article 13, point 4.[230] However, PSP may include the costs of funding and defunding in the general costs referred to point 2, letter a) of Article 17. While it may seem like a contradiction, considering the incentives that apply to the rule in Article 17, point 2, pursuant to the methodology described in Article 17, point 5, these costs are encouraged to be lowered through each yearly iteration. What Article 17, point 6, does is prohibiting the imposition of any unrecognised charge to merchants that may escape the rule.

For its part, Article 17, point 7, of the Proposal determines, similarly to the previous provision, that no inter-PSP fee shall apply to the funding and defunding of the digital euro, including digital euro payment transactions referred to in Article 13, point 4, which are the waterfall and reverse waterfall functionalities.[231] This can be understood as a legal mandate of fee protection for digital euro funding and defunding, even when waterfall and reverse waterfall functionalities apply.[232] The absence of an additional comment, in contrast to the previous point, manifests the clear intention of the European legislator of minimising costs when the waterfall and reverse waterfall functionalities require the interaction of different PSPs.[233]

[229] See article 17, point 6, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[230] *Id*.
[231] See article 17, point 7, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final
[232] See *supra* note 158.
[233] See Chapter 5 ("*Technical features of the digital euro*") of the Thesis. Digital euro users may have a digital euro payment account with a PSP and enable a non-digital euro payment account for waterfall and reverse waterfall functionalities with a different PSP. It would make no sense to allow for this option and enable the possibility of imposing fees between those two PSPs, as the resulting net will be artificially higher.

Chapter 4

Distribution of the digital euro

4.1 Introduction - Context on the Proposal

Chapters IV ("*Distribution*") and VI ("*Distribution of the digital euro outside the euro area*") of the Proposal[1] focus on the distribution of the digital euro. Chapter IV determines the actors in this relationship by referencing who may use the digital euro and who shall provide the digital euro payment services. It also provides the modalities of distribution of the digital euro in Member States who are part of the Eurosystem.[2] For its part, Chapter VI determines the limits for the distribution of the digital euro outside the euro area, differentiating between Member States whose currency is not the euro and third countries, with special treatment for those countries or territories under a monetary agreement with the European Union.

This particular structure used by the European legislator finds its motivation in the required references to Chapter V ("*Use of the digital euro as a store of value and as a means of payment*") already discussed in the previous chapter. In particular, the limits to the use of the digital euro as a store of value set in Article 16 of the Proposal[3] are qualified when applied to other countries or territories who are not Member States as described in the previous chapter. However, this structure, with two different non-consecutive chapters, might pose difficulties for the reader to understand which provisions apply to each of the

[1] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Hereinafter, "the Proposal."

[2] See "*Eurosystem*" in the *Glossary*.

[3] See Article 16 ("*Limits to the use of the digital euro as a store of value*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

categories of countries here analysed, as it will be discussed later in Section 4.3.[4]

The structure of this chapter is as follows: the first major section begins with Chapter IV of the Proposal and examines the roles of payment service providers (PSPs) and digital euro users under Article 13 of the Proposal, considering the influence of Directive 2015/2366 (PSD2), the rights and obligations of digital euro users that arises from the Proposal, and the specifics of digital euro payment services, including a thorough review of Annex I and Articles 13, points 2 to 5, of the Proposal. It also explores the legal relationships between the European Central Bank (ECB), payment service providers, and digital euro users under Article 13, point 6 of the Proposal. The chapter then moves to analysing the access to the digital euro in the euro area, guided by Article 14 of the Proposal, covering basic payment services, potential overlaps with Directive (EU) 2014/92, and issues related to digital and financial inclusion, alongside critiques and concerns about money laundering of vulnerable groups of population. The following section moves to Chapter Vi of the Proposal and addresses the access to the digital euro outside the euro area, analysing distribution mechanisms in non-euro Member States, third countries, and territories under monetary agreements with the Union, as outlined in Articles 18 to 20 of the Proposal. The chapter concludes with a discussion on cross-currency payments under Article 21, comparing the Proposal with existing standards like SWIFT and considering regulatory concerns related to these transactions.

4.2 PSPs and digital euro users - Article 13 Proposal

Chapter IV[5] addresses the distribution of the digital euro through payment service providers[6] and the access to the digital euro in Member States whose currency is the euro.[7] Article 13 of the Proposal provides context on the role of payment service providers in the distribution of the digital euro while determining who can be users of the digital euro, what services shall be provided to them and the legal relationship that arises from this interaction between these parties and the European Central Bank. For its part, Article

[4] See section 4.3 "*Access to the digital euro in the euro area - Article 14 Proposal*" below.

[5] See Chapter IV ("*Distribution*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[6] See Article 13 ("*Payment service providers*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[7] See Article 14 ("*Access to the digital euro in Member States whose currency is the euro*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

14 of the Proposal lays down considerations on the access to all basic digital euro payment services in the euro area, imposing obligations to certain credit institutions, introducing the topic of financial inclusion in the context of the digital euro.

4.2.1 PSPs in the framework of Directive 2015/2366 (PSD2)

Payment service providers (PSPs)[8] shall be the ones providing the digital euro payment services set out in Annex I, pursuant to Article 13, point (1), of the Proposal. PSPs, as defined in Directive 2015/2366 (PSD2),[9] [10] are the active subject that provide the digital euro payment services, thus creating a legal relationship with the users who access those services.[11]

The selection of PSPs to be the sole distributors of the digital euro can be justified in their privileged position to provide these services. According to the European Central Bank, PSPs already have existing direct relationships with their clients and are thus best placed to be the direct counterparts for the individuals, merchants and businesses that would use the digital euro.[12] Not only the existing legal framework based on PSD2 recommends this scenario, but also their expertise and understanding of the digital payments landscape.[13]

[8] The Proposal usually refers to payment service providers as 'PSPs' [sic] throughout the text whenever they are referenced in plural. The first references can be seen in Recitals (31) and (68) and in Article 13, point 6, of the Proposal.

[9] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC.

[10] See "*Payment service provider*" in the *Glossary*.

[11] As stated in the explanatory memorandum that accompanies the Proposal, the express reference in Article 13, point 1, to PSPs "*within the framework of Directive 2015/2366 (PSD2)*" concerns the existing authorisation granted to provide payments under said Directive in the European Union. However, not every transaction provided by PSPs will probably be subject to PSD2: it can be argued that offline digital euro payment transactions fit in the exclusions provided by Article 3 of PSD2 because of the similarity to using cash and the special considerations concerning AML and fraud prevention laid down in the Proposal. See Chapters5 ("*Technical features of the digital euro*") and 6 ("*Privacy, data protection and AML/CFT requirements*") of the Thesis.

[12] See point 9.1 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).

[13] See subsection 1.2.2.1 "*The nature of claims of CBDC and the central bank role*" in Chapter 1 of the Thesis. As a hybrid CBDC model, the digital euro benefits from the expertise of PSPs when handling retail payments, diminishing costs for the issuance and distribution of the digital euro.

4.2.2 Digital euro users - Article 13(1) Proposal

Article 13, point 1,[14] determines that natural and legal persons can be users of the digital euro. Their residency or establishment in a Member State whose currency is the euro enables the complete set of rights associated to the use of digital euro payment services. However, users may be subject to limitations based on their State of residency or establishment pursuant to conditions laid down in Chapter VI ("Distribution of the digital euro outside the euro area.") Limitations may also apply pursuant to article 16 of the Proposal.[15]

With respect to the consideration of natural persons residing[16] in the Member States whose currency is the euro,[17] the Proposal reaffirms here the definition for "residents" given in article 2, point (16), for "residence." Said article refers to Directive 2014/92/EU,[18] which considers residence rights pursuant to Union or national law valid to be considered as a resident. While there is no difficulty determining whether legal persons are established in a Member State, this consideration for natural persons enables a relevant analysis in terms of limitations that may apply. Thus, natural and legal persons who no longer reside or are established in Member States whose currency is the euro[19] and visitors[20] may be restricted by the European Central Bank in their access to and use in time of the digital euro pursuant to article 16, point 2,[21] as described in the previous chapter when analysing the rationale for such policy design.[22] For its part, the implications concerning

[14] See Article 13, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[15] See Article 16 ("*Limits to the use of the digital euro as a store of value*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[16] According to Article 13, point 1, third paragraph, of the Proposal the mention to residents in point 1, letter a), refers to European Union citizens and third country nationals who benefit from residence rights pursuant to Union law or national law. See also "*Residence*" in the *Glossary*.

[17] See Article 13, point 1, letter a) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[18] See Article 2, point 2, of Directive 2014/92/EU of the European Parliament and of the Council of 23 July 2014 on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features: "*(2) 'legally resident in the Union' means where a natural person has the right to reside in a Member State by virtue of Union or national law, including consumers with no fixed address and persons seeking asylum under the Geneva Convention of 28 July 1951 Relating to the Status of Refugees, the Protocol thereto of 31 January 1967 and other relevant international treaties.*"

[19] See Article 13, point 1, letter b) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[20] See Article 13, point 1, letter c) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[21] See *supra* note 3.

[22] See subsection 3.2.3.1 "*The necessity for limits - Recitals (2), (3), (24), (37), (49) and Article 16(1)*

natural and legal persons residing or established in Member States whose currency is not the euro,[23] or in third countries,[24] are analysed in Chapter VI despite being disclosed in article 13. Consequently, we analyse them later in the chapter.[25]

4.2.3 Digital euro payment services - Article 13(2), (3), (4) and Annex I Proposal

Annex I[26] to the Proposal sets out the digital euro payment services that PSPs may provide to the users described in Article 13, point 1. While the enumeration is merely descriptive, the services specified depict the digital euro as a digital means of payment that can be funded and defunded using non-digital euro payment accounts or cash services, when available.[27] This description presents the digital euro as a basic instrument aimed at enabling digital payments to everyone, in line with the aspirations included in the text of the Proposal.[28]

In addition to the contents addressed in Article 13, point 1, of the Proposal, other considerations regarding digital euro payment services are addressed in the same article. Thus, Article 13, number 2, of the Proposal,[29] describes the obligation for PSPs to enable digital euro users to manually or automatically fund or defund their accounts, its number 3[30] determines how PSPs must make available such funding and defunding functionalities depending on the intrinsic nature of the action being performed, either online, based on digital assets, or offline, based on cash services, and number 4[31] to that Article introduces the so-called waterfall and reverse waterfall functionalities.

Proposal" in Chapter 3 of the Thesis.

[23] See Article 13, point 1, letter d) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[24] See Article 13, point 1, letter e) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[25] Said specificities are addressed below in section 4.4 "*Access to the digital euro outside the euro area*".

[26] Annex I ("*Digital euro payment services*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[27] See subsections 4.2.3 "*Digital euro payment services - Article 13(2), (3), (4) and Annex I Proposal*" and 4.3.1 "*Basic digital euro payment services – Article 14(1) and Annex II Proposal*" below.

[28] See Recitals (2), (3), (24), (27), (49) and article 15, point (2) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[29] See Article 13, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[30] See Article 13, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[31] See Article 13, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

4.2.3.1 Annex I - Digital euro payment services in general

Annex I to the Proposal defines what the digital euro payment services consist of.[32] In particular, those services encompass the following: enabling users to access and use the digital euro;[33] [34] facilitating the initiation and receipt of digital euro payment transactions, along with providing users with digital euro payment instruments;[35] managing users' digital euro payment accounts;[36] conducting funding and defunding operations as stipulated in Article 13 of the Proposal;[37] [38] and offering additional digital euro payment services beyond the basic services outlined in Annex II.[39]

Digital euro payment services as defined in Annex I offer a general perspective on what is to be expected from the CBDC implemented by the European Union, yet they are not that revealing in terms of capabilities or specific actions that users will be able to perform. Consequently, in order to acknowledge the scope of the digital euro usage, the whole Proposal must be reviewed altogether.[40] In addition to that, letter (d) to the Annex,[41] introduces the category of "basic digital euro payment services" separating into two different tiers the characteristics presented throughout the Proposal.[42] This differentiation impacts directly on the obligation for some PSPs to provide certain digital euro payment services for free when the soliciting user is a natural person.

[32] See *supra* note 26.

[33] See *Id.*, letter (a).

[34] Subject to potential limitations established by the European Central Bank under Article 16. See subsection 3.2.3 "*Limits to the use of the digital euro as a store of value - Article 16 Proposal*" in Chapter 3 of the Thesis.

[35] See Annex I, letter (b), to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[36] See Annex I, letter (c), to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[37] See Annex I, letter (d), to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[38] Funding and defunding operations are addressed in the next subsection 4.2.3.2 "*Funding and defunding - Article 13(2) and (3)*".

[39] See Annex I, letter (e), to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[40] In terms of usability, Chapter VII of the Proposal ("*Technical features*") presents the most relevant information to understand the impact of the digital euro in the payment habits of the population.

[41] See *supra* note 37.

[42] Basic digital euro payment services and its implications are addressed below in subsection 4.3.1 "*Basic digital euro payment services – Article 14(1) and Annex II Proposal*".

4.2.3.2 Funding and defunding - Article 13(2) and (3)

The digital euro is designed in a similar fashion to a debit card: it is intended to act as a means of payment that enables transactions over the internet as well as in proximity to the payer,[43] but only when the available funds exceed the amount to be paid.[44] Consequently, an adequate system to ensure funding and defunding services is crucial. The Proposal has included these operations in both Annex I[45] and II,[46] ensuring that PSPs[47] enable digital euro users to fund and defund, manually of automatically, from or to non-digital euro payment accounts, as it can be read in article 13, point 2, of the Proposal.[48] The same provision also enables the possibility to fund or defund digital euro payment accounts from or to euro banknotes and coins when a PSP provides cash services.[49]

In accordance with Article 13, point 3, of the Proposal, PSPs must provide funding and defunding functionalities to digital euro users through non-digital euro payment accounts as well as through euro banknote and coins.[50] This definition confirms that funding and defunding, as basic digital euro payment services pursuant to Annex II,[51] can only occur when the origin or destiny of the funds is not a digital euro payment account. Despite the fact this may enable an undesired scenario for the digital euro users,[52] this

[43] See Article 23 ("*Offline and online digital euro payment transactions*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[44] This affirmation presents its nuances in the next subsection 4.2.3.3 "*Waterfall and reverse-waterfall functionalities - Article 13(4)*".

[45] See *supra* note 37. It can be read in Annex I, point d): "*Digital euro payment services consist in: [...] d) conducting funding and defunding operations in accordance with Article 13*."

[46] See *supra* note 36. It can be read in Annex II, point c): "Basic digital euro payment services for natural persons shall consist of: [...] c) non-automated funding and defunding from a non-digital euro payment account." and point d): "funding and defunding from/into cash."

[47] Article 13, point 2, of the Proposal refers to "*payment service providers that provide servicing payment services within the meaning of Directive 2015/2366*." Article 4, point (17), of Directive 2015/2366 reads as follows: "'*account servicing payment service provider' means a payment service provider providing and maintaining a payment account for a payer.*" The word "account" is missing in Article 13, point 2, of the Proposal, but it must be due to a printing mistake, since that word appears, as expected, in Article 13, point 4.

[48] See *supra* note 29.

[49] Limitations may apply to cash services, pursuant to article 16 of the Proposal, which were addressed on Chapter 3 ("*The digital euro as a store of value and as a means of payment*") of the Thesis.

[50] See Article 13, point (3), letters a) and b) of the Proposal. Only PSPs that provide cash services are required to provide funding and defunding functionalities through euro banknotes and coins.

[51] The implications of this consideration can be seen in subsection 4.3.1 "*Basic digital euro payment services – Article 14(1) and Annex II Proposal*" later in this chapter.

[52] Article 13, point (7), allows the digital euro users to "*have one or several digital euro payment accounts with the same or different payment service provider*." An extreme interpretation of article 13, point (3) in connection with Annex II and article 17, point (1) may lead to enabling PSPs to charge for transactions that occur between digital euro payment accounts of the same ownership. The European legislator may need to offer a clearer language.

provision ensures universal access to digital euro services. PSPs must make available funding and defunding functionalities at any point in time, on a continuous basis, where they take place through non-digital euro accounts.[53] Similarly, PSPs that provide cash services must make available such functionalities where they take place through euro banknotes and coins.[54] The contrast between both provisions is unmistakable: while operations to be made using a non-digital euro payment accounts must be available unceasingly, the same is not required to funding and defunding functionalities based on cash services. Digital euro users can anticipate that these functionalities may be only available during designated timeframes.[55] The instant availability of funds transferred from or to a non-digital euro payment account makes it the preferred option, but the enablement of cash services to access digital euro payment services is in line with the goals set in the Proposal for the establishment of the digital euro and its legal tender status.[56] [57]

4.2.3.3 Waterfall and reverse-waterfall functionalities - Article 13(4)

The Proposal demands PSPs to enable digital euro users to fund or defund their digital euro payment accounts manually or automatically under the requirements laid down in Article 13, point 3, as seen in the previous sub-section. While the process for manual operations can be inferred from point 2 of the same article, the explicit reference to an automatic process implies the existence of a case of use for which the regulator has crafted this asseveration. Indeed, the Proposal refers to “waterfall”[58] and “reverse waterfall”[59] functionalities as an approach to deal with the holding limits that the European Central

[53] See Article 13, point 3, letter a) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[54] See Article 13, point 3, letter b) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[55] This equivalence to cash withdrawals and deposits in commercial banks is reasonable. It would be both unfair and excessive to require PSPs that provide cash services to offer such maintenance on a continuous basis, hence this difference in treatment.

[56] See Article 12, point 1, of the Proposal, in connection with Article 13, point 5. The Proposal is ensuring the convertibility of the digital euro at par with both scriptural money and electronic money denominated in euro.

[57] See subsection 4.3.1.3 "*Credit institutions that shall provide the basic digital euro payment services – Article 14(1), Annex I PSD2 and Article 14(3) Proposal*" below for additional analysis on cash services and which credit institutions are required to provide cash services.

[58] See "*Waterfall functionality*" in the *Glossary*.

[59] See "*Reverse waterfall functionality*" in the *Glossary*.

Bank may adopt pursuant to Article 16.[60] Thus, the text stipulates that PSPs must enable users to have their digital euros in excess to said limits automatically defunded to a non-digital euro payment account ("waterfall functionality"), as well as to authorise a digital euro payment transaction for which the amount exceeds their current digital euro holdings ("reverse waterfall functionality").[61] This functionalities are only available to digital euro users who have previously authorised their PSP to link their digital euro payment account to a single non digital euro payment account, which may be held by a different PSP, pursuant to point 4 of Article 13.[62]

Three elements are worth mentioning concerning this provision. First, the requirement of prior approval to enable the functionalities is adequate to ensure that, by default, the digital euro works as a means of payment akin to a debit card. Those users who are interested in smooth payment transactions, similar to the experience of using other comparable digital means of payment, will be the ones enabling this functionality.[63] Second, each digital euro payment account can only be linked to a non-digital euro payment account.[64] While the digital euro could have been designed to support the linking of multiple accounts to act under predetermined circumstances,[65] efficiency has been the most likely rationale for the resulting choice. Finally, the Proposal prevents PSPs from demanding digital euro users to have a non-digital euro payment account with the same PSP in order to use this functionality. This choice is respectful with the digital euro users and prevents commercial abuse from PSPs. As it can be inferred from the Proposal, the digital euro is aimed at providing free access to digital payments while respecting each user's preferences. Including a mandate to PSPs in this direction ensures they will

[60] See recitals (36), (40) and (64) of the Proposal. Article 13, point (4), describes the waterfall and reverse waterfall functionalities, yet they are not addressed using these names. In fact, said names are not used anywhere in the text of the Proposal except for the abovementioned recitals.

[61] Article 14, point 4, letters a) and b) refer to online digital euro payment transactions. Since automatic funding functionalities require internet access to occur, offline digital euro payment transactions can never benefit from this functionality. This will be addressed in depth in Chapter 5 ("*Technical features of the digital euro*") of the Thesis.

[62] See Article 13, point 4, second paragraph, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[63] Likewise, the Proposal does not include any requirement to hold a non-digital euro payment account to use the digital euro payment services. Requiring it as a mandatory feature would follow no purpose.

[64] See Article 13, point 4, second paragraph, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[65] See subsection 5.2.4 "*Conditional digital euro transactions vs. Programmable money – Article 24 Proposal*" in Chapter 5 of the Thesis. Similar to the intrinsic logic behind the design of conditional payments as described in Article 24 of the Proposal, a similar design could have been implemented to work under these circumstances.

not be taking advantage of users, making them hostages of a given PSP.[66]

4.2.4 Article 13(5) – *At par with scriptural*

Article 13, point 5, of the Proposal proclaims the convertibility at par of the digital euro with scriptural money[67] and electronic money denominated in euro.[68] This recognition is in line with the content of Article 12 of the Proposal,[69] as it has been indirectly analysed previously.[70]

The categories of scriptural and electronic money are addressed for the first and last time in the Proposal in this article, with the exception of the Recitals.[71] However, no definition is provided for any of them, requiring its analysis through a circular review from PSD2[72] to Directive 2009/110/EC[73] in the case of the latter, without any express reference for the first. In any case, the analysis of its implications can still be derived from the conclusions drawn previously in this Thesis for a similar provision.[74]

4.2.5 Legal relationship between the European Central Bank, PSPs and digital euro users - Article 13(6) Proposal

In accordance with Article 13, point 6, of the Proposal, digital euro users shall only enter into a contractual relationship with PSPs, as they shall never have any contractual relationship with the European Central Bank or the national central banks when it comes

[66] Despite the express mandate, PSPs must be controlled after the Regulation entries into force. PSPs' front-end services may trick users into thinking that having a non-digital euro account with the same PSP is required to use this functionality. Subsection 5.3.4 "*Front-end services to access and use the digital euro – Article 28 Proposal*" in Chapter 5 of the Thesis addresses this idea.

[67] See "*Scriptural money*" in the *Glossary*.

[68] See "*Electronic money [denominated in euro]*" in the *Glossary*.

[69] See Article 12 ("*Interaction between the digital euro and euro banknotes and coins*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[70] See section 2.5 "*Interaction between the digital euro and euro banknotes and coins – Article 12 Proposal*" in Chapter 2 of the Thesis.

[71] See Recitals (22) and (26) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[72] See Article 4, point (25) of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2.)

[73] See Article 2, point 3, of Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions amending Directives 2005/60/EC and 2006/48/EC and repealing Directive 2000/46/EC.

[74] See *supra* note 70.

to the provision of digital euro services as described in Annex I.[75] As it has been addressed previously,[76] the hybrid design chosen for the digital euro makes it a liability in the European Central Bank's balance sheet, pursuant to Article 4 of the Proposal.[77] This does not mean that there is a contractual relationship between digital euro users and the ECB. The digital euro is designed to work the same as euro banknotes and coins, and there is no contractual relationship between citizens and the ECB there either. The ECB is only responsible for the distribution of the digital euro,[78] maintenance of the digital euro settlement infrastructure[79] and dispute resolution support.[80] Accordingly, pursuant to article 13, point 6, of the Proposal, digital euro users will only enter into a contractual relationships with PSPs. The main consequence of this consideration is that the ECB cannot be held liable for any malfunction experienced during a digital euro payment transaction, and the same happens with fraudulent interactions in which the digital euro has been used as a means of payment. This provision prevents any claims against the ECB on those terms coming from the affected digital euro users.

However, it could be argued that the ECB can still be hold responsible. Any claim that is linked to unproper maintenance of the digital euro settlement infrastructure could be redirected to the Eurosystem, the same it happens with damages associated to TARGET's malfunction.[81] [82] Therefore, users may claim against their chosen PSP for malfunctions and they will be directly reimbursed and PSPs will be able to claim a compensation to the Eurosystem when causation can be proven.

[75] See Article 13, point 6, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[76] See subsection 1.2.2.1 "*The nature of claims of CBDC and the central bank role*" in Chapter 1 of the Thesis.

[77] See Article 4 ("*Issuance of the digital euro*"), point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[78] Which is the subject matter of Chapter V of the Proposal.

[79] See "*Digital euro settlement structure*" in the *Glossary*.

[80] See Article 27 ("*Dispute mechanism*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. See also subsection 5.3.3 "*Dispute mechanism – Article 27 Proposal*" in Chapter 5 of the Thesis.

[81] See *ECB publishes an independent review of TARGET incidents in 2020*, European Central Bank – Eurosystem, retrieved from: https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210728~cb0848ee42.en.html. Last accessed on August 28, 2024.

[82] Claims to the TARGET compensation scheme can be sent to the Eurosystem using a form that is similar to this one: https://www.ecb.europa.eu/paym/target/consolidation/profuse/shared/pdf/target_claim_form.en.pdf.

4.2.6 Article 13(7) – Multiple accounts

Article 13, point 7, of the Proposal determines that digital euro users may have one or several digital euro payment accounts with the same or different PSPs.[83] This provision enables the possibility of owning multiple digital euro payment accounts, which may be beneficial for the user, yet it presents several subjects that require additional analysis.

First, from a technical perspective, the managing of digital euro holding limits, as addressed in Article 16, point 4, of the Proposal,[84] may suppose examination difficulties to ensure they are not vulnerated by digital euro users, either on purpose or by mistake.[85] Since holding limits consider the natural and legal person who owns the funds, yet the ownership of multiple digital euro payment accounts is allowed by this provision, difficulties may arise when contrasting whether a digital euro user is circumventing said holding limits, especially when the user has two or more accounts with different PSPs. The difficulties that may arise from this scenario are set to be minimised from a technical perspective, as described later in this work.[86]

Secondly, concerning the needs a digital euro user may have to hold more than one digital euro payment account, as it may lack a proper rationale. The European Central Bank is favourable to the idea of limiting to one digital euro account per user, as the monetary authority mentions reasons of efficiency, technical difficulties, as addressed above, and proportionality in the use of a "*free public service*."[87] However, the Proposal explicitly enables this possibility in its Article 16, point 6,[88] since the European legislator acknowledged the utility this provision may bring to prospective digital euro users.[89] The debate brought upon by the monetary authority of the euro area in this topic seems to be misaligned with concrete expectations of the European legislator, hence why changes to this extent may be expected in the final version of the Proposal.

[83] See Article 13, point 7, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[84] See Article 16, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[85] See subsection 3.2.3.2.2.3 "*Limits on multiple accounts / An account owned by multiple people - Articles 16(6) and 16(7) Proposal*" in Chapter 3 of the Thesis.

[86] See subsection 6.5.3 "*Single access point*" in Chapter 6 of the Thesis.

[87] See point 9.2 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).

[88] See Article 16, point 6, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[89] See *supra* note 85.

4.2.7 Article 13(8) – Information

Finally, Article 13, point 8, of the Proposal establishes the obligation for the PSPs to make available to the public, free of charge, accessible information about the specific features of digital euro payment services and the conditions of its distribution.[90] This provision, in line with the objectives of financial and digital inclusion laid down in the Proposal, also ensures that consumers will have adequate access to the binding conditions that govern their access to digital euro payment services freely and in an accessible format. The European legislator ensures like this that all relevant information can be accessed by all kind of digital euro users, no matter their digital skills, and that abusive terms cannot be hidden from the user when accepting the conditions of use and access of the digital euro.

4.3 Access to the digital euro in the euro area - Article 14 Proposal

Article 14 of the Proposal delimits the access to the digital euro in Member States whose currency is the euro,[91] or so it seems. While the mandate in this provision seems to be referring exclusively to Member States whose currency is the euro, should the reader consider the content of Articles 18, point 2, letter c),[92] and 19, point 2, letter b),[93] this Article is also of application to Member States whose currency is not the euro[94] and third countries with whom the European Union has concerned a monetary agreement,[95] respectively. This confusing structure could have been prevented should the European legislator have chosen an alternative structure in the Proposal, unifying Chapters IV and VI.

In addition to that, it must be pointed out that, despite its explicit reference in point 2

[90] See Article 13, point 8, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[91] See Article 14 ("*Access to the digital euro in Member States whose currency is the euro*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[92] See Article 18, point 2, letter c) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[93] See Article 19, point 2, letter b) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[94] Subject to a prior arrangement.

[95] Subject to a prior agreement. The reader is advised to mind the difference with the previous note.

of Article 14 of the Proposal, Directive (EU) 2014/92[96] is not included in the applicable law considered in Article 5 of the Proposal.[97] The European legislator should ensure that all relevant legislative act of the European Union that are applicable to the Proposal are adequately included in said provision.[98]

This section is structured as follows: first, the basic digital euro payment services are addressed. Second, the possibility of an overlapping between this Proposal and Directive (EU) 2014/92 is analysed. Finally, the topic of financial inclusion in the Proposal is studied in connection with anti-money laundering measures.

4.3.1 Basic digital euro payment services – Article 14(1) and Annex II Proposal

Article 14 of the Proposal determines that credit institutions that provide payment services as referred to in points 1, 2 or 3 of Annex I to Directive (EU) 2015/2016 shall provide with all basic digital euro payment services as referred to in Annex II to natural persons as referred to in Article 13, point 1, letter a).[99] Consequently, the legal analysis required for this provision enables three different questions: first, why the European legislator has selected a reduced group for this provision. Second, which digital euro services are considered as basic in the Proposal. And, third, which credit institutions are required to provide said basic digital euro payment services. Each of these questions are addressed individually in the next sub-sections.

4.3.1.1 The reference to natural persons in Article 13(1)(a)

Article 14 of the Proposal sets a mandate to credit institutions to provide natural persons residing in the Member States whose currency is the euro.[100] By referencing article 13,

[96] Directive 2014/92/EU of the European Parliament and of the Council of 23 July 2014 on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features.

[97] See Article 5 (“Applicable law”) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[98] Similarly, the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Authority for Anti-Money Laundering and Countering the Financing of Terrorism and amending Regulations (EU) No 1093/2010, (EU) 1094/2010, (EU) 1095/2010 (COM/2021/421 final) is neither addressed in Article 5 of the Proposal despite being referenced in Article 14, point 5. See subsection 6.7.1 "*References to AML/CFT in Article 14(5) and 19(3) Proposal*" in Chapter 6 of the Thesis on this topic.

[99] See Article 13, point 1, letter a), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[100] See *Id*.

point (1), letter a), yet exclusively natural persons, the European legislator is explicitly excluding legal persons residing in the euro area[101] as well as the rest of categories of digital euro users that have been previously referenced in section 2.b) of this chapter. To understand the rationale for this selection, we must address separately the reasoning followed for excluding the rest of the categories considered in Article 13.

The rationale for excluding all users included in letters b) to e) in Article 13[102] can be found in the territorial scope of the Proposal. Since the distribution of the digital euro will only be guaranteed for Member States whose currency is the euro upon the publication of the Proposal, the European Union cannot impose a mandate for credit institutions providing services outside the euro area. Only in the event of acceptance of external digital euro distribution[103] an obligation to accept and satisfy all the requirements laid down by the Proposal will be born.

However, in what respect to the exception concerning legal persons, the rationale is founded in the Proposal, but it remains obscure for the reader at this point of the analysis. Articles 15 and 17[104] in Chapter V ("Use of the digital euro as a store of value and as a means of payment") set out the reasoning. While article 15, point 2, acknowledges the possibility of "*fees to be paid by natural persons*",[105] article 17, point (1), claims that PSPs shall not charge fees to natural persons for the provision of basic digital euro payment services referred to in Annex II.[106] [107] As previously seen in Chapter 3,[108] only natural persons are expected to have access to the basic features of the digital euro for free.[109]

[101] *Id*.

[102] See Article 13, point (2) letters b) ("*natural and legal persons who no longer reside or are established in Member States whose currency is the euro*"), c) ("*visitors*"), d) ("*natural and legal persons residing or established in Member States whose currency is not the euro*") and e) ("*natural and legal persons residing or established in third countries*"), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[103] To be discussed in section 4.4 "*Access to the digital euro outside the euro area*" below.

[104] The Proposal adequately defines "merchant service charge" but no "inter-PSP fee." The European legislator is encouraged to consider including a definition for the latter too.

[105] See Article 15, point (2), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[106] See Article 17, point (1), of the Proposal. This article states that "*natural persons as referred to in Article 13(1), points (a), (b) and (c)*" shall not be charged any fees by PSPs "*for the provision of the basic digital euro payment services referred to in Annex 2* [sic]." Natural persons in points (b) and (c) are also excluded in article 14. The wording used by the European legislator in article 14 might be in conflict with that of the article 17, as seen in Chapter 3 ("*The digital euro as a store of value and as a means of payment*") of the Thesis.

[107] Article 17, point (1), of the Proposal incorrectly refers to Annex II as "*Annex 2*."

[108] See subsection 3.3.3 "*Free for natural persons on basic digital euro payment services - Article 17(1) and Annex II Proposal*" in Chapter 3 of the Thesis.

[109] See subsection 3.3.3 "*Free for natural persons on basic digital euro payment services - Article 17(1) and Annex II Proposal*" in Chapter 3 of the Thesis.

Consequently, the imposition of an obligation to credit institutions is nuanced to guarantee that natural persons can access those basic features for free, while avoiding an overly excessive imposition.[110] The necessity for a back and forth analysis when addressing this consideration may be enough for the European legislator to consider an improvement in the structure followed in the Proposal.

4.3.1.2 Review of the basic digital euro payment services – Annex II Proposal

Basic digital euro services are itemised in Annex II of the Proposal.[111] [112] The seven-entry list displayed in Annex II includes all essential services that are required to utilise the digital euro as a means of payment with legal tender status,[113] from opening and closing a digital euro payment account,[114] to initiating and receiving digital euro payment transactions.[115] However, some of the functionalities presented in Annex II may present particularities that recommend its analysis.

Beginning with letter d),[116] the Proposal imposes to credit institutions the obligation to allow digital euro users to fund or defund their accounts from or into cash, hence enabling the availability of cash services with the consideration of a free service. While it

[110] Precisely in the context of Articles 15 and 17 of the Proposal, the nature of merchant service charges and inter-PSP fees is relevant. The Proposal is designed to ensure the legal tender status of the digital euro, as proclaimed in Article 7, is acquired despite the existing tension between the mandatory acceptance and the expected free use by citizens, as addressed in Chapter 4 of the Thesis. Should the imposition laid down in Article 15 to credit institutions become excessive to them, there would be a loss of incentives for these key distributors of the digital euro to promote its usage. Thus, the principle of proportionality proclaimed in Article 17, point 2, of the Proposal applies both ways and ensure a reasonable imposition of access to the digital euro.

[111] See Annex II ("Basic digital euro payment services") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[112] See "*Basic digital euro payment services*" in the *Glossary*.

[113] See points 9.7 to 9.9 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). The European Central Bank has suggested expanding the list of basic digital euro payment services to ensure any user can access all relevant characteristics of the digital euro for free once it is implemented. The ECB suggests including "*automated funding and defunding*" (addressed in Article 13, point 4 and in Section 2 of this chapter) and "*the switching of a digital euro account from one PSP to another*" (addressed in Article 31 and in Chapter 6 of this text), as the monetary institution considers that these two characteristics are intrinsically required. However, in what respects "automated funding and defunding", it could be argued that it is already included under letter f) of Annex II and the ECB is only requesting an express reference to it to balance letter c) to Annex II which references "*non-automated funding and defunding*." For its part, letter f) to Annex II reads: "*(f) digital euro payment transactions referred to in Article 13(4)*" which references waterfall and reverse waterfall functionalities of the digital euro.

[114] See *supra* note 111, letter a).

[115] See *supra* note 111, letter e).

[116] See *supra* note 111, letter d).

is true that, under Recommendation 2010/191/UE,[117] credit institutions in the European Union cannot refuse to accept cash, because of its legal tender status,[118] it has become a common practice to restrict its acceptance under certain permissiveness of national authorities.[119] The European Union can contribute to clarify the exceptions, if any, to the scenario presented in letter d) to improve the access to cash services with the Proposal for a Regulation on the legal tender of euro banknotes and coins,[120] which would repeal the aforementioned Recommendation if approved.

Concerning letter e),[121] "conditional digital euro payment transactions other that standing orders" are excluded from the list of basic services. As per Article 24 of the Proposal, conditional payments are a functionality of the digital euro that may be implemented, but it is still under discussion.[122] In any case, since the definitions provided for "conditional payments" are not that revealing,[123] standing orders[124] are, together with waterfall and reverse waterfall functionalities,[125] the most obvious manifestations of this category, hence its inclusion in Annex II.

Finally, letter g)[126] refers to the provision of at least one electronic payment instrument for the execution of digital euro payment transactions. This provision is aligned with the rest of references that exist throughout the entire Proposal to ensure financial inclusion of those digital euro users in need of assistance to access it.[127] However, this explicit reference enables the discussion of whether there is overlapping between this Proposal

[117] COMMISSION RECOMMENDATION of 22 March 2010 on the scope and effects of legal tender of euro banknotes and coins (2010/191/EU).

[118] See *Id.*, point 6 "*Legal tender of 1 and 2 euro cent coins and rounding rules*." The legal tender of 1 and 2 euro cent coins is not at discussion as they are still valid to discharge from a debt and can be used as a means of payment, despite common practice to disallow it.

[119] See, e.g., *¿Existe un límite a la cantidad de monedas que se pueden entregar para un ingreso o pago? ¿Pueden cobrarme comisión por ello?*, Banco de España - Eurosistema, retrieved from: https://clientebancario.bde.es/pcb/es/menu-horizontal/podemosayudarte/criterios/Existe_un_limi_85ebcbc262be861.html. Last accessed on August 26, 2024.

[120] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the legal tender of euro banknotes and coins. COM (2023) 364 final.

[121] See *supra* note 111, letter e).

[122] See Recital (55) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[123] See subsection 5.2.4 "*Conditional digital euro transactions vs. Programmable money – Article 24 Proposal*" in Chapter 5 of the Thesis.

[124] See "*Standing order*" in the *Glossary*.

[125] See "*Waterfall functionality*" and "*Reverse waterfall functionality*" in the *Glossary*.

[126] See *supra* note 111, letter g).

[127] See subsections 4.3.3 "*Digital and financial inclusion – Article 14(4) and 14(5) Proposal*" in Chapter 4 and 5.3.9.1 "*Critique – The technological progress paradox*" in Chapter 5 of the Thesis.

and Directive (EU) 2014/92,[128] as it will be addressed below.[129]

4.3.1.3 Credit institutions that shall provide the basic digital euro payment services – Article 14(1), Annex I PSD2 and Article 14(3) Proposal

As previously seen in this Chapter, Article 14, point 1, of the Proposal establishes a mandate to credit institutions[130] to provide natural persons[131] with all basic digital euro payment services as referred to in Annex II.[132] [133] This determination requires a deeper analysis onto which are the parties required to comply with the obligation, as the Proposal introduces several nuances.

According to the Proposal, credit institutions that provide payment services as referred to in points 1, 2 and 3 of Annex I to Directive (EU) 2015/2366 (PSD2)[134] are required to provide natural persons with the aforementioned basic digital euro payment services.[135] Consequently, the obligation is laid down to payment services enabling cash to be placed on a payment account,[136] payment services enabling cash withdrawals from a payment account,[137] and payment services that allow the execution of payment transactions.[138] The restrictive selection of PSPs that are required to provide the basic digital euro payment services contrasts with the content of Article 13, point 1, of the Proposal.[139] The rationale for this selection is founded in two main reasons. The first one concerns the lack of

[128] Directive 2014/92/EU of the European Parliament and of the Council of 23 July 2014 on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features.

[129] See subsection 4.3.2 "*Overlapping between this Proposal and Directive (EU) 2014/92 – Article 14(2)*" below.

[130] See "*Credit institution*" in the *Glossary*.

[131] See subsection 4.3.1.1 "*The reference to natural persons in Article 13(1)(a)*" above.

[132] See Article 14, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[133] See *supra* note 111.

[134] See Annex I ("*Payment Services*"), points 1, 2 and 3, to Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2).

[135] See subsection 4.3.1.2 "*Review of the basic digital euro payment services – Annex II Proposal*" above.

[136] See *supra* note 134, point 1. As well as all the operations required for operating a payment account.

[137] See *supra* note 134, point 2. As well as all the operations required for operating a payment account.

[138] See *supra* note 134, point 3. Including transfers of funds on a payment account with the user's payment service provider or with another payment service provider: (a) execution of direct debits, including one-off direct debits; (b) execution of payment transactions through a payment card or a similar device; (c) execution of credit transfers, including standing orders. See "*Standing order*" in the *Glossary*.

[139] See subsection 4.2.2 "*Digital euro users - Article 13(1) Proposal*" in Chapter 4 of the Thesis. Said provision enables any payment service provider within the framework of PSD2 to provide the digital euro payment services, yet it does not impose any obligation to a given set of PSPs as it happens in Article 14, point 1.

proportionality that it would entail to impose such obligation to any PSP within the framework of PSD2, regardless of its size. While Article 13 of the Proposal enables any PSP to provide digital euro payment services, not everyone is qualified to ensure the provision of basic digital euro payment services and it would have been disproportionate to enforce it. The second one refers to the requirement in Annex II of the Proposal to provide cash services to digital euro users.[140] While Article 13, point 2, of the Proposal[141] requires only PSPs that provide cash services to allow digital euro users to fund and defund their digital euro payment accounts using cash, all credit institutions that are considered in Article 14, point 1,[142] must provide this service.[143]

In line with the requirement on cash services, Article 14, point 3, of the Proposal[144] establishes an additional consideration of relevance. Thus, Member States shall designate the authorities referred to in Article 1, letter f), of the Directive (EU) 2015/2366 (PSD2),[145] or post office giro institutions referred to in Article 1, letter c), of the PSD2[146] to provide basic digital euro payment services to natural persons referred to in Article 13, point 1, letter a),[147] that do not hold or do not wish to hold a non-digital euro payment account,[148] and to provide basic digital payment services and provide digital inclusion support provided face-to-face in physical proximity to persons with disabilities, functional limitations or limited digital skills, and elderly people.[149] These two considerations are

[140] See *supra* note 116.
[141] See *supra* note 99.
[142] See *supra* note 132.
[143] It could be argued, however, that this consideration must be qualified and that there is room for improvement in this provision. The European legislator may consider a change in the language used to clarify whether this is an explicit obligation or the obligation imposes by mistake the provision of cash services to all credit institutions included in the definition of Article 14 of the Proposal.
[144] See Article 14, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[145] See Article 1, letter f), of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2). Said article refers to categories of payment service provider: Member States or their regional or local authorities when not acting in their capacity as public authorities.
[146] See Article 1, letter c), of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Services Directive or PSD2). Said article refers to categories of payment service provider: post office giro institutions which are entitled under national law to provide payment services.
[147] See *supra* note 99, letter a): "*Natural and legal persons residing or established in the Member States whose currency is the euro*."
[148] See Article 14, point 3, letter a), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[149] See Article 14, point 3, letter b), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

addressed later in this Thesis because of the specific implications that they hold.[150]

Finally, it must be said that Article 14, point 1, of the Proposal only imposes the obligation to provide the aforementioned digital euro basic payment services upon request of the authorised digital euro users.[151] Consequently, only those basic services that are explicitly requested by the digital euro users must be enabled to them. The provision ensures that the digital euro is designed to ease users, not to complicate their transactions using the digital euro.[152]

4.3.2 Overlapping between this Proposal and Directive (EU) 2014/92 – Article 14(2)

As introduced in the previous section,[153] Article 14, point 2, of the Proposal determines that natural residing or established in the Member States whose currency is the euro[154] and that do not hold a non-digital euro account can benefit of the application of Chapter IV of Directive (EU) 2014/92[155] to the access to digital euro account with basic services by consumers.[156] However, the provision excludes the application of Articles 17 and 18 of said Directive. Reviewing said Chapter, it is possible to find some level of overlapping between this Proposal and that Directive. While there are differences that justify the decision made by the European legislator, the digital euro is portraited too similarly to a basic payment account in several aspects included in the Regulation. Consequently, an analysis on the apparent redundancy is required.

[150] See subsection 4.3.2 "*Overlapping between this Proposal and Directive (EU) 2014/92 – Article 14(2)*" and 4.3.3 "*Digital and financial inclusion – Article 14(4) and 14(5) Proposal*" below and 5.3.9.1 "*Critique – The technological progress paradox*" in Chapter 5 of the Thesis for letter a) and b) of Article 14, point 3, of the Proposal, respectively.

[151] See *supra* note 108.

[152] Not all users have the same needs. In line with the content of Article 14, point 4, of the Proposal (addressed below in 4.3.3 "*Digital and financial inclusion – Article 14(4) and 14(5) Proposal*"), the digital euro must ensure that its users can access and use it with easy, being adapted to their needs and limitations.

[153] See subsection 4.3.1.3 "*Credit institutions that shall provide the basic digital euro payment services – Article 14(1), Annex I PSD2 and Article 14(3) Proposal*" above.

[154] Natural persons as referred to in Article 13, point 1, letter a), of the Proposal.

[155] See Chapter IV ("*Access to payment accounts*") of Directive 2014/92/EU of the European Parliament and of the Council of 23 July 2014 on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features.

[156] See Article 14, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

4.3.2.1 Differences

Chapter IV ("*Access to payment accounts*") of Directive (EU) 2014/92 ensures that consumers legally resident in the European Union[157] are not discriminated by credit institutions in what refers to accessing a payment account within the European Union.[158] In particular, consumers legally resident in the European Union are entitled to open and use a payment account with basic features with credit institutions,[159] which must include several characteristics as defined in Article 17 of Directive (EU) 2014/92[160] and whose fees are heavily regulated in Article 18 of the same Directive.[161] All things considered, Directive (EU) 2014/92 ensures appropriate access to residents in the European Union to financial intermediation services that are virtually free for basic use.[162] Since the Directive ensures access to payment accounts with basic features, the similarities with the contents of the Proposal and the basic digital euro payment services that must be offered for free for a certain group of the population pose an uncanny resemblance.

To prevent the apparent overlapping between the digital euro and the content of Directive (EU) 2014/92, the Proposal has explicitly avoided the application of Articles 17 and 18 of said Directive.[163] Consequently the express reference to Directive (EU) 2014/92 is made to ensure that digital euro users are guaranteed to have access to a digital euro payment account with basic services in the same terms as they have for basic payment accounts. Thus, the European legislator is equating the ease of access to basic payment accounts and digital euro accounts in the European Union. This ensures that the distribution of the digital euro is not trumped by PSPs in favour of classic payment accounts while imposes the same legal obligations to all PSPs that fall in the category

[157] See "*Residence*" in the *Glossary*.

[158] See Article 15 ("*Non-discrimination*") of Directive 2014/92/EU of the European Parliament and of the Council of 23 July 2014 on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features.

[159] See Article 16 ("*Right of access to a payment account with basic features*") of Directive 2014/92/EU of the European Parliament and of the Council of 23 July 2014 on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features.

[160] See Article 17 ("*Characteristics of a payment account with basic features*") of Directive 2014/92/EU of the European Parliament and of the Council of 23 July 2014 on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features.

[161] See Article 18 ("*Associated fees*") of Directive 2014/92/EU of the European Parliament and of the Council of 23 July 2014 on the comparability of fees related to payment accounts, payment account switching and access to payment accounts with basic features.

[162] Directive (EU) 2014/92 was promulgated to help underbanked population, promoting financial inclusion for residents in the European Union. Said topic is addressed in subsection 4.3.3 "*Digital and financial inclusion – Article 14(4) and 14(5) Proposal*" below.

[163] See *supra* notes 160 and 161.

described in Article 14, point 1, of the Proposal.

However, while the intention of the European legislator can be inferred performing an analysis like the one presented in the previous paragraph, the similarity of both instruments, basic payment accounts and digital euro payment accounts with basic services, enables the debate on the real nature of the digital euro and whether there is overlapping between the Proposal and Directive (EU) 2014/92 despite the intentions of the European Union authorities.

4.3.2.2 Critique – Is the digital euro equivalent to a public bank account?

As reiterated throughout the Proposal,[164] the digital euro is not meant to be equivalent to a public banking institution nor is considered akin to a commercial bank payment account. The most obvious limit in this respect is set by the existence of limits to the use of the digital euro as a store of value in the form of holding limits as laid down in Article 16 of the Proposal.[165] However, despite the explicit of these references, the existence of functionalities that may enable the use of digital euro payment accounts circumventing the holding limits[166] may justify the debate on whether the digital euro is a public manifestation of a classic payment account.

The efforts made by the European legislator in the Proposal avoiding the application of Articles 17 and 18 of Directive (EU) 2014/92[167] have not been enough to make the differentiation as evident as intended. Those articles have been avoided altogether because of the obvious similarities that the characteristics of a basic payment account and basic digital euro payment services share.[168] This raises the questions of whether the Directive (EU) 2014/92 has succeeded in its goal since its entry into force and of whether a central

[164] This idea has been reiterated in Chapters 1 and 3 of the Thesis, when addressing the interaction between the issuer of a CBDC and commercial banks, as well as the possibility of an interest-bearing digital euro.

[165] See Article 16 ("*Limits to the use of the digital euro as a store of value*") Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[166] It could be argued, however, that the existence of waterfall and reverse-waterfall functions as laid down in Article 13, point 4, of the Proposal allow digital euro users to circumvent online digital euro holding limits, hence rendering this consideration futile when differencing a digital euro payment account from a regular payment account.

[167] See *supra* notes 160 and 161.

[168] Comparing the content of Article 17 of Directive (EU) 2014/92 and Annex II of the Proposal reveals an enumeration of characteristics that are very similar in content and expected effect. Both allow their users to have a free payment account which includes access to the basic operations that are essential for their use.

bank digital currency (CBDC) is needed at all in the European Union.[169] [170]

An argument in favour of the differentiation between basic payment accounts and digital euro payment accounts with basic services may come from the conduct of commercial banks towards the implementation of the digital euro. As apparently designed, the digital euro is overlapping some of the financial intermediation functions that are allocated to them, yet commercial banks have become important partners in the implementation and distribution of the digital euro. This may be pointing out that the equivalences are not that similar and that, outside from an academic outlook, the overlapping of functions is not that consequential.

4.3.3 Digital and financial inclusion – Article 14(4) and 14(5) Proposal

Digital and financial inclusion are a relevant topic for researchers and regulators equally in Western economies nowadays.[171] The European legislator has made explicit the aim for a digital euro that is accessible for all users, no matter their age, financial literacy or digital skills. However, digital and financial inclusion do not refer to the same phenomenon,[172] but they interconnect when dealing with digital payments: not all underbanked population[173] [174] experiences digital skills issues, yet the inability to deal with new technologies of those who struggle with digital solutions causes them to usually become underbanked population too.

[169] See subsection 1.3.4.1 "*Why a digital euro in the form described in the Proposal*" in Chapter 1 of the Thesis. The debate on whether a CBDC is needed at all, instead of improving the settlement infrastructure for digital payments, focuses on the duplicity of functions of the digital euro.

[170] See, e.g., Vodrážka, M., Bízek, T., & Vojta, M. (2022). Are there relevant reasons to introduce a retail CBDC in the Czech Republic from the perspective of the payment system. *BIS Papers*, *65* and DANMARKS NATIONALBANK (2017). Central bank digital currency in Denmark? Available at: https://www.nationalbanken.dk/media/rgqompbp/analysis-central-bank-digital-currency-in-denmark.pdf.

[171] See Raghuveera, N. (2020). Central bank digital currency can contribute to financial inclusion but cannot solve its root causes. *Atlantic Council*. See also Tan, B. J. (2024). Central bank digital currency and financial inclusion. *Journal of Macroeconomics*, 81, 103620.

[172] The Proposal reference them indistinctly by mistake. The European legislator is encouraged to differentiate them accordingly. This topic will be addressed in subsection 5.3.9.1 "*Critique – The technological progress paradox*" in Chapter 5 of the Thesis.

[173] See "*Unbanked/Underbanked population*" in the *Glossary*.

[174] See Recital (5) of the Proposal. In an attempt to unify concepts, up to three different categories are listed: “unbanked”, “underbanked” and “offline” population. While the first two clearly refer to the same reality, “offline population” does not only refer to a sector of the population unable to access financial intermediation, but a sector of the population who struggle with technology. The European legislator is encouraged to unify concepts where needed and clarify different categories to ensure both financial and digital inclusion are adequately addressed in the Proposal. See also "*Offline population*" in the *Glossary*.

The Proposal addresses financial inclusion for the first time in Article 14 of the Proposal. In particular, Article 14, point 4, establishes that PSPs are required to provide digital inclusion support to persons that require such assistance. For its part, Article 14, point 5, of the Proposal focuses on the financial inclusion of vulnerable groups considering AML/CFT requirements. Each of these provisions are analysed below.

4.3.3.1 Content of the Proposal – Article 14(4) and other references

In line with what has been said previously,[175] Article 14, point 4, establishes that the PSPs referred to in points 1 to 3[176] of the same article are required to provide digital inclusion support to persons with disabilities, functional limitations or limited digital skills, and elderly persons.[177] In addition to that, the Proposal determines that digital inclusion support shall comprise a dedicated assistance for onboarding to a digital euro account and using all basic digital euro services,[178] without prejudice to point 3, letter b), of the same article.[179]

The categories of those in need, as addressed by this provision, probably do not exhaust the whole collective that might need assistance, which is why the examples do not constitute an exhaustive list.[180] In any case, this provision sets the general obligation for PSPs to provide help to those who need it. Consequently, we may expect this provision to be of application to additional categories of users who are experiencing difficulties when accessing or using the digital euro.

4.3.3.2 Money laundering and vulnerable groups – Article 14(5)

Finally, Article 14, point 5, of the Proposal[181] serves a dual function. On the one hand, it introduces the Anti-Money Laundering Authority (AMLA) of the European Union, not referenced so far in the Proposal, but subsequently mentioned.[182] On the other, it

[175] See subsection 4.3.1.3 "*Credit institutions that shall provide the basic digital euro payment services – Article 14(1), Annex I PSD2 and Article 14(3) Proposal*" above.
[176] *Id*.
[177] See Article 14, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[178] *Id*.
[179] See *supra* note 144.
[180] The verb "*comprise*" is used, indicating that other may beneficiate from this provision.
[181] See Article 14, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[182] AMLA is referenced in Recital (79) and, again, in the last paragraph of Article 37 ("*Anti-money laundering rules applying to offline digital euro payment transactions*") of the Proposal.

establishes that AMLA and the European Banking Authority (EBA) shall jointly issue guidelines specifying the interaction between AML/CFT requirements and the provision of basic digital euro payment services to specific vulnerable collectives, focusing on their financial inclusion.[183]

Concerning AMLA, it must be said that its existence is conditional on the approval of the Proposal for a Regulation establishing the Authority for Anti-Money Laundering and Countering the Financing of Terrorism.[184] However, the European legislator is positive about its implementation, which would allow this new Regulation to act as a single rulebook for AML/CFT in the European Union.[185]

Concerning the second part of the provision, the Proposal references various categories of vulnerable groups that are subject to the guidelines issued by AMLA and EBA. In particular, the groups explicitly included are asylum seekers or beneficiaries of international protection, individuals with no fixed address or third country nationals who are not granted a residence permit but whose expulsion is impossible for legal or factual reasons. In any case, the language in the provision enables both authorities to include in their guidelines other categories of vulnerable groups should it be necessary.

What may come as striking is the explicit acknowledgement in this article of the AML/CFT issues that these vulnerable groups may cause with regard to the use of the digital euro. The European legislator is aware of the money laundering issues that may arise from an unregulated framework for prospective digital euro users who belong in these vulnerable groups. However, despite mentioning it, no specific measure is introduced in this provision nor anywhere in the Proposal,[186] and is left for AMLA, who is an inexistent authority at the time being,[187] and EBA to address. A topic with this relevance should be adequately regulated, otherwise its inclusion is moot. The European legislator could benefit from addressing the topic in connection with the rest of the AML/CFT measures,

[183] See *supra* note 181.

[184] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Authority for Anti-Money Laundering and Countering the Financing of Terrorism and amending Regulations (EU) No 1093/2010, (EU) 1094/2010, (EU) 1095/2010. COM/2021/421 final.

[185] See point 1 ("*CONTEXT OF THE PROPOSAL – Reasons for and objectives of the proposal*") of the Explanatory Memorandum that accompanies the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Authority for Anti-Money Laundering and Countering the Financing of Terrorism and amending Regulations (EU) No 1093/2010, (EU) 1094/2010, (EU) 1095/2010. COM/2021/421 final.

[186] Chapter IX ("*Anti-money laundering*") of the Proposal does not address this specific topic.

[187] See *supra* note 185.

including a more concrete analysis of the situation.[188]

4.4 Access to the digital euro outside the euro area

Chapter VI sets out the conditions for the distribution of the digital euro outside the euro area. While articles 18 ("Distribution of the digital euro to natural and legal persons residing or established in Member States whose currency is not the euro") and 19 ("Distribution of the digital euro to natural and legal persona residing or established in third countries") mirror their contents with minor variations that are disclosed below, article 20 ("Distribution of the digital euro to natural and legal persons residing or established in third countries or territories under a monetary agreement with the Union") introduces certain specialties that may apply when dealing with the distribution of the digital euro in those territories. Accordingly, this section is structured to present the content of articles 18 to 20 focusing on the relevant particularities that the Proposal has introduced for each of the geographical clusters considered.

4.4.1 Distribution in Member States whose currency is not the euro – Article 18 Proposal

Article 18 of the Proposal describes the relevant considerations concerning the distribution of the digital euro in Member States outside the euro area. Thus, PSPs may only distribute the digital euro to natural and legal persons residing or established in a Member State whose currency is not the euro should the ECB and the national central bank of said Member State have signed an arrangement to that effect.[189] The contents of said arrangement as well as other necessary considerations are addressed in points 2 and 3 of the same article.[190] For its part, Article 18, point 4, of the Proposal imposes the implementation of holding limits that are aligned with those applicable to the use of the

[188] In any case, the content of Chapter IX ("Anti-money laundering") and its AML/CFT measures is also at discussion in this Proposal because of its inadequacy to address all relevant implications in digital euro payment transactions. See subsection 6.7.1.1 "*Critique – AML should have been addressed altogether*" in Chapter 6 of the Thesis.

[189] See Article 18, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[190] See Article 18, points 2 and 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

digital euro as a store of value.[191] [192]

4.4.1.1 Arrangement and conditions – Article 18(1), (2) and (3) Proposal

Article 18, point 2, addresses the content of the arrangement referenced in point 1 of the same article.[193] The conditions described require the Member State whose currency is not the euro to notify the other Member States, the European Commission and the European Central Bank the request to distribute the digital euro to natural and legal persons residing or established in that Member State.[194] In said request, the Member State will guarantee that its national bank will accept any rules, guidelines, instructions or requests issued by the ECB in relation to the digital euro;[195] and that it will provide all information requested by the monetary authority of the European Union in terms of access to and use of the digital euro in that Member State.[196] Additionally, the Proposal requires the Member State whose currency is not the euro to adopt all the national legislations necessary to ensure respect of the relevant requirements laid down or the rules and standards adopted pursuant to Article 5, point 2.[197] [198] [199] Collaboration is expected, as this kind of coordination between the ECB and the central bank of those Member States is quite usual, as the process to align monetary interests within the European Union includes coordination between the euro zone and Member States whose currency is not the euro.[200] In addition to that, a new Regulation proposal has been published to address this kind of distribution,[201] although its content is mostly redundant to what is included in

[191] See Article 18, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[192] See subsection 3.2.3.2 "*Limits in the Proposal and their application*" in Chapter 3 of the Thesis.

[193] See Article 18, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[194] *Id.*, letter a).

[195] *Id.*, letter b), point (i)

[196] *Id.*, letter b), point (ii).

[197] *Id.*, letter c).

[198] See Article 5 ("Applicable law"), point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[199] It could be argued that the contents of letter c) may obliterate those of letter b)(ii). Any Member State adopting the Proposal to distribute the digital euro is required to share information on access to and use of the digital euro with the European Central Bank per Article 35 ("*Processing of personal data by the European Central Bank and the national central banks*") of the Proposal.

[200] *The euro outside the euro area – Links to other currencies*, European Commission, retrieved from: https://economy-finance.ec.europa.eu/euro/use-euro/euro-outside-euro-area_en. Last accessed on August 27, 2024.

[201] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the provision of digital euro services by payment services providers incorporated in Member States whose currency is not the euro and amending Regulation (EU) 2021/1230 of the European Parliament and the Council. COM/2023/368 final.

this Proposal. Consequently, PSPs established in Member States whose currency is not the euro are expected to be the first outsiders to be granted authorization for the distribution of the digital euro, as it contributes to the objectives of the European Economic Area.[202]

The simple process described in this article can be compared with the demanding procedure that is imposed to any Member State who wishes to join the euro zone.[203] [204] [205] While not comparable, because of the implications of each, the Proposal pictures the arrangement here described as a much easier task to accomplish. The arrangement process has been designed ensuring that is accessible and easy to undertake, because universal adoption, especially among the rest of Member States, is essential for the legal tender status objective of the digital euro.[206]

Finally, Article 18, point 3,[207] determines that the described arrangement[208] shall specify the necessary implementing measures and procedures and the cases under which the agreement may be restricted, suspended or terminated. No specific reference is included here, contrary to Article 19 below,[209] because of the beneficial treatment guaranteed for Member States, as they have already complied with anti-money laundering measures laid down in the European Union.[210]

[202] See points 11.1 and 11.3 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).
[203] See Article 140, point 1, of the Treaty on the Functioning of the European Union.
[204] See the PROTOCOL (No 13) ON THE CONVERGENCE CRITERIA in the Treaty on the Functioning of the European Union.
[205] *Conditions for joining the euro area: convergence criteria*, Council of the European Union, retrieved from: https://www.consilium.europa.eu/en/policies/joining-the-euro-area/convergence-criteria/. Last accessed on August 27, 2024.
[206] See Chapter 2 ("*The legal tender status of the digital euro*") of the Thesis on the topic of the legal tender status of the digital euro.
[207] See Article 15, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[208] *Id*. The Proposal refers to the arrangement as “agreement” in said article, which may be erroneous according to infra notes 225 and 227.
[209] See subsection 4.4.2 "*Distribution in third countries – Article 19 Proposal*" in Chapter 4 of the Thesis. In particular, subsection 4.4.2.2 "*AML/CFT considerations – Article 19(3) and (4) Proposal*" addresses this consideration.
[210] See *Economic accession criteria*, European Commission. Available at: https://economy-finance.ec.europa.eu/international-economic-relations/candidate-and-neighbouring-countries/enlargement/economic-accession-criteria_en. Last accessed on October 25, 2024. Compliance with AML/CFT considerations laid down by European Union law is required to become an eligible country to join the European Union.

4.4.1.2 Same limits consideration – Article 18(4)

The limits to the store of value of the digital euro have been already discussed in Chapter 3 of this Thesis.[211] In particular, Article 16 of the Proposal introduce and justify the need for holding limits affecting the digital euro.[212] Its point 5,[213] enables holding limits for natural and legal persons residing or established in Member States whose currency is not the euro, subject to the conditions laid down in Article 18 of the Proposal.[214] [215] In addition, Article 16, point 5, establishes that said limits shall never be higher to those set out for Member States whose currency is the euro, they must be applied in a non-discriminatory manner and uniformly across Member States whose currency is not the euro and have adopted an arrangement as described in article 18, point 1. Finally, Article 16, point 5, requests the European Central Bank to consult the national central banks of Member States whose currency is not the euro when setting the parameters that enable the holding limits.

While the need for holding limits has already been reasoned,[216] the uniform application throughout all Member States whose currency is not the euro and have adopted an arrangement as described in Article 18 of the Proposal presents additional difficulties. Thus, Member States whose currency is not the euro have not benefited from the same monetary coordination as Member States in the euro zone, enabling the debate on whether it is adequate to set out the same holding limits despite the steep differences that may exist among their currencies.[217]

As introduced in the previous paragraph, this issue has not been addressed for the common holding limits set out for Member States whose currency is the euro because of their partially aligned economies under the monetary policy of the European Central

[211] See subsection 3.2.3 "*Limits to the use of the digital euro as a store of value - Article 16 Proposal*" in Chapter 3 of the Thesis.

[212] See Article 16 ("*Limits to the use of the digital euro as a store of value*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[213] See *Id.*, point 5.

[214] See Article 13, point 1, letter d) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[215] The Proposal cites article 16, point 4, by mistake in Article 18, point 4. The proper reference is article 16, point 5.

[216] See *supra* note 211.

[217] In a similar fashion to the analysis presented in note **??** in Chapter 3 of the Thesis, an adequate holding limit for, e.g., Sweden may become excessive for Romania, thus minimising the beneficial incentives associated to its implementation.

Bank and the Eurosystem.[218] The adoption of the single currency has brought together their economies, softening the likely negative effects described above for Member States whose currency is not the euro. Consequently, the European legislator is encouraged to reconsider the scope of this provision, as its effect may bring undesired effects to the distribution of the digital euro should it be authorised in the future for Member States whose currency is not the euro.

4.4.2 Distribution in third countries – Article 19 Proposal

Article 19 of the Proposal mirrors the contents of Article 18, with minor variations justified in the nature of the countries considered.[219] Thus, the digital euro may only be distributed to natural and legal persons residing or established in third countries if the European Union and the third country have signed a prior agreement to that effect.[220] The contents of the needed negotiation and said arrangement, as well as other necessary considerations concerning anti-money laundering measures, are addressed in points 2 and 3 of the same article,[221] with point 4 determining that negotiations can be suspended on the basis of deficiencies found on those grounds.[222] Finally, Article 19, point 5, of the Proposal imposes the implementation of holding limits that are specific for the third country that is signing the agreement,[223] contrary to what is stated for Member States whose currency is not the euro in Article 18, point 4.[224]

4.4.2.1 Agreement and conditions – Article 19(1), (2) and (3) Proposal

Article 19, point 2, describes the process required for a third country to be eligible for an agreement[225] as described in the previous point.[226] The first difference with

[218] See *Id*. Despite this fact, the imposition of common holding limits was also criticised in Chapter 3 of the Thesis.

[219] See Article 19 ("*Distribution of the digital euro to natural and legal persons residing or established in third countries*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[220] See Article 19, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[221] *Id*., points 2 and 3.

[222] *Id*., point 4.

[223] *Id*., point 5.

[224] See *supra* note 191.

[225] See *infra* note 227. The term "agreement" is used instead of "arrangement" because it involves foreign policy of the European Union.

[226] See Article 19, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

the process described for Member States whose currency is not the euro can be found here. The Council of the European Union,[227] based on a recommendation from the European Commission after having consulted the European Central Bank, shall decide on the arrangements for the negotiation with a third country for the distribution of the digital euro.[228] In addition, the third country must ensure that it complies with all three conditions laid down in that article.[229] It can be seen that letters a)(i), a)(ii) and b) are essentially the same conditions included in Article 18 of the Proposal in its letters b)(i), b(ii) and c). However, letter c) is new, yet sensible: the European authorities require the third country to ensure its intermediaries are subject to, at least, the same control as PSPs do in the European Union, which is in line with the objective of distributing the digital euro outside the euro area.[230] [231]

For its part, Article 19, point 3, determines that the described agreement shall specify the necessary implementing measures and procedures and the cases under which the agreement may be restricted, suspended or terminated in particular where the third country has been identified as a third country with significant strategic deficiencies in its national anti-money laundering and combating the financing of terrorism.[232] [233] The agreement shall also be complemented by an arrangement between the European Central Bank and the national central bank of the third country.[234]

[227] See Article 218 of the Treaty on the Functioning of the European Union. The Council of the European Union must conclude the European Union's international agreements with other countries.

[228] See *supra* note 226.

[229] See *Id*. Said Article establishes: "*(a) the third country ensures that: (i) its national central bank and, where appropriate, its national competent authority shall abide by any rules, guidelines, instructions or requests issued by the European Central Bank in relation to the digital euro; (ii) its national central bank and, where appropriate, its national competent authority shall provide all information on the use of digital euro in that third country that the European Central Bank may require; (b) the third country has adopted all the national legislations necessary to ensure respect of the rules and standards laid down in this Regulation or adopted pursuant to Article 5(2). (c) the third country ensures that intermediaries established or operating in the third country that distribute the digital euro are subject to supervisory and regulatory requirements, that are at least equivalent to those applied to payment service providers established in the Union.*"

[230] See, e.g., Recital (49) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[231] However, it could be argued that implementing this Proposal would require to adopt PSD2 as an explicit requirement laid down in Article 5 of the Proposal. The Proposal could benefit from an improvement in the language used to prevent this difficulties of understanding its application.

[232] See Article 19, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[233] Due to its significance, this point is analysed in depth in the next sub-section of the text.

[234] Article 19, point 3, of the Proposal also states that "*where appropriate, the national competent authority of the third country*", in case the relevant monetary authority of the third country is not its national central bank.

4.4.2.2 AML/CFT considerations – Article 19(3) and (4) Proposal

Article 19, point 3, of the Proposal mirrors the content of Article 18, point 3. However, it also includes new references to the anti-money laundering (AML) and combating the financing of terrorism (CFT) regime that applies in the third country. Should the third country be identified as a third country with "*significant strategic deficiencies*" or "*with compliance weakness*" in its national anti-money laundering and combating the financing of terrorism regime as referred to in Articles 23 and 24, respectively, of the Proposal for an Anti-Money Laundering Regulation,[235] the negotiations may be suspended or the agreement can be terminated according to Article 19, point 4, of the Proposal.[236]

While AML and CFT measures are specifically addressed in Article 37 of the Proposal,[237] the considerations included in this article go beyond the requirements considered for distributing the digital euro, as they must be analysed in advance by the relevant organisms in the European Union during the negotiation stage of the process described in Article 19, point 1. However, the structure chosen by the European legislator for Article 19, and in particular for its points 3 and 4, might be confusing for the reader. While point 3 references the specific considerations that the agreement must include, focusing on the identification of the third country as problematic pursuant to Articles 23 and 24 of the Proposal for an Anti-Money Laundering Regulation,[238] point 4 determines that negotiations, which are a previous stage according to Article 19, point 2, may be suspended based on said identification. Despite it could be argued that the reader can still infer the consequences when reading altogether both point 3 and 4, it is rather unlikely that the European Union would sign an agreement with a third country that is already identified as problematic in terms of AML/CFT measures,[239] so a reformulation is encouraged.

[235] See Articles 23 ("*Identification of third countries with significant strategic deficiencies in their national AML/CFT regimes*") and 24 ("*Identification of third countries with compliance weaknesses in their national AML/CFT regimes*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing. COM/2021/420 final. Hereinafter, "the Proposal for an Anti-Money Laundering Regulation."

[236] See Article 19, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[237] See section 6.7 "*Anti-Money Laundering – Chapter IX – Article 37 Proposal*" in Chapter 6 of the Thesis.

[238] See *supra* note 235.

[239] As it stands right now, the consideration in Article 19, point 3, of the Proposal suits the scenario in which the European Union and a third country sign an agreement and, later, said country falls under one of the categories described in Articles 23 and 24 of the Proposal for an Anti-Money Laundering Regulation, which would probably cause the agreement to be terminated.

4.4.2.3 Article 19(5) – Holding limits

For its part, Article 19, point 5,[240] follows the same rationale as Article 18, point 4, did concerning the application of holding limits to the digital euro.[241] The explicit reference to Article 16, point 5, enables the application of limits that cannot be higher than the ones effective implemented in the euro area for natural and legal persons[242] residing or established in Member States whose currency is the euro.[243] Contrary to Article 18, point 4, the holding limits that apply in this case are individually selected for each of the third countries whose PSPs may be authorised to distribute the digital euro.[244]

What remains to be seen is which third countries might be interested in distributing the digital euro and which of those are likely to be authorised under Article 19 of the Proposal instead of Article 20 below.[245] While the euro is widely used outside the euro area in global currency markets, its main presence as currency appears on territories under a monetary agreement with the European Union,[246] and only a few other countries use the euro as *de facto* currency according to the European Commission.[247] Should we consider other countries, mostly unrelated from a historic point of view to Europe, it is likely that their own monetary sovereignty would be at stake, preventing such an agreement or, at least, downsizing the expected distribution.[248]

[240] See Article 19, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[241] See subsection 4.4.1.2 "*Same limits consideration – Article 18(4)*" above.
[242] In particular, natural and legal persons as referred to in Article 13(1), point (e) ("*Natural and legal persons residing or established in third countries [...] subject to the conditions laid down in Articl(e) 19*") are the ones being considered in Article 19, point 5.
[243] See Article 16, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[244] Sensible design, since there are no criteria to align a common limitation. However, it could be argued that the European Union may end up defining common holding limits for third countries that share characteristics, although it is unheard of yet.
[245] See subsection 4.4.3 "*Distribution in third countries or territories under a monetary agreement with the Union – Article 20 Proposal*" below.
[246] *Id*.
[247] textitThe euro outside the euro area, European Commission, retrieved from: https://economy-finance.ec.europa.eu/euro/use-euro/euro-outside-euro-area_en. Last accessed on August 27, 2024.
[248] Recitals (38) and (4) of the Proposal already present this idea, as the European Union must prevent any scenario in which the digital euro could replace the local currency.

4.4.3 Distribution in third countries or territories under a monetary agreement with the Union – Article 20 Proposal

In accordance with Article 20, point 1, of the Proposal, natural and legal persons residing in Andorra, Monaco, San Marino and the Vatican City State, the French overseas collectivities of Saint-Barthélemy and Saint Pierre and Miquelon, or in any other third country or territory[249] under a monetary agreement for the purpose of authorising to use the euro as its official currency,[250] may be distributed the digital euro,[251] following an amendment of the respective monetary agreement to that effect.[252] These territories are differenced from third countries considered in Article 19[253] because of their special ties with the European Union and the existence of specific agreements concerning the use of the euro in their jurisdictions. Thus, this provision is an extension of said agreements, which exist

[249] While the wording in Article 20, point 1, enables the possibility of considering other countries rather than those explicitly included the European Central Bank has requested that the Proposal may specify other particular situations, at least in the recitals. In particular, point 9.4 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34), references the position of Union citizens residing in Northern Ireland and whether their access to digital euro would be subject to a monetary agreement with the United Kingdom.

[250] In accordance with Council Regulation (EC) No 1103/97 of 17 June 1997 on certain provisions relating to the introduction of the euro, and Council Regulation (EC) No 974/98 of 3 May 1998 on the introduction of the euro.

[251] The reader must notice a change in the subject of this sentence, as it is presented in a passive voice instead of the active voice used previously. While the previous subject of the sentence was "the PSPs", this consideration uses a passive voice as it is likely that these territories have to rely on PSPs from other countries, likely Member States, to distribute the digital euro.

[252] See Article 20 ("*Distribution of the digital euro to natural and legal persons residing or established in third countries or territories under a monetary agreement with the Union*"), point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[253] See the previous subsection.

for each of the referred countries.[254] [255] [256] [257] [258] [259]

Finally, point 2 to Article 20 determines that the distribution of the digital euro in the countries under a monetary agreement as described in the previous point shall meet[260] the requirements laid down in the Proposal.[261] This is an indirect mandate to ensure all requirements included in the Proposal are met, which may be seem as redundant. However, Article 20 of the Proposal has not included a provision equivalent to those of Article 18, point 2, letter (c),[262] or Article 19, point 2, letter (b),[263] which explicitly require the adoption of all rules and standards laid down in the Proposal.

4.5 Cross-currency payments – Article 21 Proposal

The possibility to enable cross-currency payments between the digital euro and other currencies is addressed in Article 21 of the Proposal,[264] in addition to the enablement of interoperable payments between the digital euro and the currencies of Member States whose currency is not the euro. This sub-section addresses the content of the aforementioned Article and provides some insight of the current standards of cross-currency payments, namely the standard adopted by the Society for Worldwide Interbank Financial Telecommunications (SWIFT.)

[254] For Andorra, Council Decision 2004/548/EC of 11 May 2004 on the position to be taken by the Community regarding an agreement concerning the monetary relations with the Principality of Andorra, and Council Decision 2004/750/EC of 21 October 2004 on the opening of the negotiations on an agreement concerning monetary relations with the Principality of Andorra.

[255] For Monaco, Council Decision 1999/96/EC of 31 December 1998 on the position to be taken by the Community regarding an agreement concerning the monetary relations with the Principality of Monaco.

[256] For San Marino, Council Decision 1999/97/EC of 31 December 1998 on the position to be taken by the Community regarding an agreement concerning the monetary relations with the Republic of San Marino.

[257] For the Vatican City State, Council Decision 1999/98/EC of 31 December 1998 on the position to be taken by the Community regarding an agreement concerning the monetary relations with Vatican City, and Council Decision 2003/738/EC of 7 October 2003 on the adoption of amendments to be made to the Monetary Agreement between the Italian Republic and the Vatican City State.

[258] For Saint-Barthélemy, EUROPEAN COUNCIL DECISION of 29 October 2010 amending the status with regard to the European Union of the island of Saint-Barthélemy (2010/718/EU), and Monetary Agreement between the European Union and the French Republic on keeping the euro in Saint-Barthélemy following the amendment of its status with regard to the European Union.

[259] For Saint Pierre and Miquelon, Council Decision 1999/95/EC of 31 December 1998 concerning the monetary arrangements in the French territorial communities of Saint-Pierre-et-Miquelon and Mayotte.

[260] See *supra* note 251.

[261] See Article 20, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[262] See *supra* note 197.

[263] See *supra* note 92.

[264] See Article 21 ("*Cross-currency payments*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

4.5.1 Cross-currency payments in the Proposal

Article 21, point 1, of the Proposal[265] enables the possibility of allowing cross-currency payments between the digital euro and other currencies should they be subject to a prior agreement between the European Central Bank and the national central banks of the Member States whose currency is not the euro or[266] the third countries. This provision is aligned with the content of Articles 18 to 20 of the Proposal[267] as it reinforces the obligation to celebrate a prior agreement before enabling such functionality, effectively gatekeeping the development of any cross-currency payment structure for the digital euro.

To fully understand the impact of the aforementioned provision, a definition of what is a cross-currency payment[268] is needed. However, cross-currency payments are not defined in the Proposal. We need to take into consideration the definition provided by the European Central Bank to understand that a cross-currency payment concerns a transaction between the payer and payee that include a currency conversion as part of the payments chain.[269] To clarify further the concept of cross-currency payment, it is also needed to address that cross-border payments[270], as described in Regulation EU 2021/1230, are not enough to capture the essence of what the European legislator is describing in Article 21 of the Proposal,[271] as it can be implied from Recital (51).[272]

[265] See Article 21, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[266] See *Id*. The language of the provision uses "and" instead of "or." While the message is still clear, the use of a disjunctive conjunction is encouraged to avoid any confusion to the reader.

[267] See Articles 18 ("*Distribution of the digital euro to natural and legal persons residing or established in Member States whose currency is not the euro*"), 19 ("*Distribution of the digital euro to natural and legal persona residing or established in third countries*"), and ("*Distribution of the digital euro to natural and legal persons residing or established in third countries or territories under a monetary agreement with the Union*") of the Proposal.

[268] See "*Cross-currency payment*" in the *Glossary*.

[269] See note (72) of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).

[270] See "*Cross-border payment*" in the *Glossary*.

[271] Any payment transaction in which the payer and the payee are located in different Member States is considered a cross-border payment. Article 21 of the Proposal refers to the interaction between the digital euro and other currencies. International transactions within the euro area that use the digital euro as a means of payment do not require any special consideration: they are settled in the digital euro settlement infrastructure and they share a common unit of account, the digital euro. However, hypothetical transactions that would be initiated using a different currency but would end up satisfying a debt measured in digital euros, or vice versa, fit into the scenario described in Article 21 of the Proposal. In any case, it could be argued that the European legislator could have included a definition for this term, as it would have simplified the analysis.

[272] Recital (51) describes the usefulness derived from the implementation of cross-currency payments for the digital euro, referencing explicitly the possibility of *facilitating cross-border payments for the purpose of*

Therefore, the European legislator is encouraged to provide in the Proposal a definition of cross-currency payments that satisfy its intentions when detailing its prospective existence.

For its part, Article 21, point 2, of the Proposal fosters the cooperation between the European Central Bank and the national central banks of Member States whose currency is not the euro to enable interoperable payments between the digital euro and other currencies.[273] In line with the concerns expressed in the previous paragraph, the concept of "interoperable payment" is not provided in the Proposal. In any case, this category of payments may be inferred from other definitions available,[274] and in the light of Article 26 of the Proposal.[275] Thus, the mandate in Article 21, point 2, calls for the cooperation of the European Central Bank and the national central banks of the Member States whose currency is not the euro to collaborate in the development of adequate standards that ensure an adequate flow between the digital euro and other currencies in the European Union. This is why it needs to be pointed out that this mandate is limited to the rest of the Member States who are not in the euro zone, which is sensible due to the geographic closeness, the existence of a single market in the European Union and the alignment of interests despite not sharing the single currency.[276]

4.5.2 Analysis of current standards – SWIFT analysis

Cross-currency payments have challenged payment infrastructures for decades because of the fragmentation of technology and standards, the different compliance requisites laid down in international jurisdictions, time zones and the usual need of employing multiple intermediaries that increase the transaction chain and the cost of the transaction.[277] In addition to that, the existence of significant barriers to entry in competition for the providers of these financial services has slowed the implementation of new technolo-

trade or remittances.

[273] See Article 21, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[274] See "*Interoperable payment system*" in the *Glossary*.

[275] See Article 26 ("*Interoperability*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[276] This can be inferred from Recital (52), in addition to the wording in Article 21, point 2, of the Proposal.

[277] See *Cross-border payments*, Bank of England. Retrieved from: https://www.bankofengland.co.uk/payment-and-settlement/cross-border-payments. Last updated on January 31, 2023. Last accessed on September 12, 2024. Despite the explicit reference to cross-border payments instead of cross-currency payments, the content of the article actually refers to the latter.

gies.[278] Therefore, standardisation has been identified as a key feature that needs to be enabled from a global perspective, involving as many countries and relevant financial institutions as possible.[279] In this context, the Society for Worldwide Interbank Financial Telecommunications, commonly known as SWIFT,[280] has emerged as the most relevant standard provider for cross-currency payments in the world.[281]

The prospected issuance of the digital euro, as well as other CBDCs, has caused an uproar in the cross-currency payment landscape because of provisions such as the one included in Article 21 of the Proposal. Consequently, SWIFT has made progress on the implementation of innovative systems based on the technology provided by CBDCs, because of its potential usefulness as an interlinking solution for cross-border payments.[282] However, the impact derived from the implementation of the digital euro in the leading standard's business is still unclear, albeit some authors have already theorised on it.[283]

The unpredicted scenarios that the implementation of cross-currency payments in the settlement infrastructure of the digital euro raise concerns that go beyond fair competition in financial services. Thus, relevant regulatory concerns on this topic are addressed in the next subsection.

4.5.3 Regulatory concerns

The enablement of cross-currency payments between the digital euro and other currencies entails a technological revolution in the financial sector. Despite being conditional on prior agreements that are yet to be negotiated,[284] the European legislator is clearly manifesting the intention of the monetary authorities of the European Union, foreseeing

[278] See *Id*. The settlement of cross-border, in particular cross-currency, payments requires efforts that are capital intensive to be able to provide such services.

[279] See *Enhancing Cross-border Payments – Stage 1 report to the G20*, Financial Stability Board. Available at: https://www.fsb.org/2020/04/enhancing-cross-border-payments-stage-1-report-to-the-g20/. Published on April 9, 2020. Last accessed on September 12, 2024.

[280] See *Swift history*, Swift. Retrieved from: https://www.swift.com/about-us/history. Last accessed on September 12, 2024.

[281] See *Ripple and Swift slug it out over cross-border payments*, Financial Times. Available at: https://www.ft.com/content/631af8cc-47cc-11e8-8c77-ff51caedcde6. Published on June 6, 2018. Last accessed on September 12, 2024.

[282] See *Swift advances CBDC innovation as interlinking solution begins beta testing*, Swift. Retrieved from: https://www.swift.com/news-events/press-releases/swift-advances-cbdc-innovation-interlinking-solution-begins-beta-testing. Published on September 13, 2024. Last accessed on September 12, 2024.

[283] See Spiotta, Giacomo. *Cryptocurrencies and the Digital Euro: their structure and functioning, could they really replace SWIFT?*. Diss. Politecnico di Torino, 2023.

[284] See *supra* note 265.

the implementation of cross-currency payments based on the digital euro. While feasible, some regulatory concerns may arise from its authorisation.

For instance, cross-currency payments between the digital euro and other currencies could be easily exploited against the objectives of the implementation of the digital form of the single currency if not adequately regulated. Instant settlement between different currencies would imply a revolution in traditional services of financial intermediation, such as currency exchange services. This could enable the appearance of business models based on said type of financial intermediation with theoretical ways to circumvent holding limits[285] that would cause the digital euro to be used differently than intended, increasing the number of operations above the ideal equilibrium in pursuit of financial reward.[286] Consequently the European legislator should address the implementation of this functionality considering limitations that ensure it is used responsibly and for the purposes that recommend its enactment.[287]

[285] See subsection 3.2.3.2.2.3 "*Limits on multiple accounts / An account owned by multiple people - Articles 16(6) and 16(7) Proposal*" in Chapter 3 of the Thesis. An undertaking that would involve multiple natural persons who jointly-own a digital euro payment account could enable the availability of sufficient funds to enable such business model within the limits of the Proposal.

[286] While the theoretical scenario presented is extreme by nature to ensure the consequences are visible, the number of cross-currency payment transactions to be experimented would be higher than ideal if no limits are considered when enabling such functionality.

[287] For instance, such undertakings as described in *supra* note 285 could be explicitly prevented by including limitations of use to this functionality, or by enabling the imposition of reasonable fees that difficult the implementation of any business model based on this kind of intermediation model. Nothing in the Proposal indicates whether or not cross-currency payments will be part of the basic digital euro payment services that must be provided to natural persons; therefore this analysis is moot at this time.

Chapter 5

Technical features of the digital euro

5.1 Introduction – Chapter VII

Chapter VII ("*Technical features*") of the Proposal[1] addresses the technical features considered by the European legislator for the digital euro once issued. Divided into two parts, Section 1 includes Articles 22 to 24 and describes some of the basic digital euro functionalities, such as accessibility concerns, online and offline digital euro payment transactions and conditional digital euro payment transactions. For its part, Section 2 includes Articles 25 to 33 and addresses different topics that revolve the technical design selected for the digital euro, from fraud detection and prevention to specific modalities of distribution such as the European Digital Identity Wallets.

While it is true that the common topic for all aspects considered in this section of the Proposal can be linked to technical features of the digital euro, Chapter VII is hard to analyse and sometimes requires considering unrelated considerations. The titles the European legislator has chosen for the Chapter itself and its two sections hardly capture everything that is addressed in Articles 22 to 33 of the Proposal. In addition, some inclusions are contented to be in the Proposal at all,[2] which reinforces the criticism on the Chapter altogether.

The structure of this chapter is as follows: first, the digital euro functionalities as considered in Articles 22 to 24 are addressed, considering the design, accessibility and use

[1] See Chapter VII ("*Technical features*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Hereinafter, "the Proposal."

[2] See, e.g., subsection 5.3.1 "*European Digital Identity Wallets – Article 25 Proposal*" in Chapter 5 of the Thesis.

of the digital euro, including online and offline digital euro payment transactions and the possibility of enabling conditional payments in the digital euro settlement infrastructure. Second, the content of Articles 25 to 33 is addressed individually, attending to the content of provisions that analyse several technical aspects of the digital euro, such as the interoperability of standards, front-end services to access and use the digital euro, the general fraud detection and prevention mechanism, or the topic of digital inclusion, among others.

5.2 Digital euro functionalities – Section 1 – Chapter VII

The content of Section 1 of Chapter VII of the Proposal[3] references essential design characteristics of the digital euro, describing features that enable its ease of accessibility and use by prospective digital euro users. In addition to that, online and offline digital euro payment transactions are finally introduced and differentiated in the Proposal, after being explicitly addressed before, albeit without sufficient context.[4] Finally, conditional payments, their definition, in contrast to programmable money as defined in the Proposal, are introduced as a likely future characteristic of digital euro payment transactions.

In order to analyse from a legal perspective, the relevant content in Section 1 of Chapter VII of the Proposal, this section is structured to address Articles 22, 23, and 24 separately, providing sufficient context to the decisions made by the European legislator when structuring each of the provisions considered.

5.2.1 Accessibility and use – Article 22 Proposal

Article 22, point 1, of the Proposal mandates that the digital euro must have usage and service features that are simple and easy to handle, particularly for individuals with disabilities, functional limitations, limited digital skills, and older persons.[5] Additionally, it requires that the digital euro be accessible to persons with disabilities by complying

[3] See Section 1 ("*Digital euro functionalities*") in Chapter VII of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[4] See Articles 8 ("*Territorial scope of legal tender status"), 13 ("Payment service providers*"), 16 ("*Limits to the use of the digital euro as a store of value*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[5] See Article 22, point 1, letter a), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

with the accessibility requirements set out in Annex I of Directive 2019/882,[6] [7] ensuring that the digital euro is both user-friendly and inclusive for all individuals.

The Proposal has previously addressed inclusion concerns in Article 14,[8] yet it will analyse it again in Chapter VII, separately: here in Article 22, point 1, and on Article 33.[9] Reviewing all these articles together may contribute to the thought that the European legislator could have addressed digital and financial inclusion of the digital euro users in a common section of the Proposal, instead of requiring a holistic approach. In any case, the current location for each provision makes sense in its content, yet it could be sensible to consider a change in the structure. Not only this would allow for clarity but actual measures that contribute to the objectives laid down in the Proposal could be also included.[10]

Concerning the contents of Article 22, point 1, the requirements laid down in its letter a) are essential and easily justifiable, as they contribute to improve the accessibility and use of the digital euro to persons with disabilities, functional limitations, limited digital skills and older persons.[11] However, as it stands, letter b) feels redundant.[12] The explicit reference to Annex I of the European Accessibility Act[13] imposes a set of characteristics that must be met to comply with the accessibility requirement, yet they are mostly aligned with the content of letter a), which concerns usage features. These two categories are difficult to delimitate and the existing wording in the Proposal does not help in that direction.[14]

[6] See Article 22, point 1, letter b), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[7] Annex I to DIRECTIVE (EU) 2019/882 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 April 2019 on the accessibility requirements for products and services.

[8] See subsection 4.3.3 "*Digital and financial inclusion – Article 14(4) and 14(5) Proposal*" in Chapter 4 of the Thesis.

[9] See also subsection 5.3.9 "*Fair, reasonable and non-discriminatory access to mobile devices – Article 33 Proposal*" below.

[10] See point 2.3 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). While the European Central Bank "*welcomes that the proposed regulation includes explicit provisions to extend public support for less digitally sophisticated persons who may need personal assistance with digital euro transactions*", the Proposal lacks concrete measures to that extent. A change in the structure, as proposed, could help in this direction.

[11] See *supra* note 5.

[12] See *supra* note 6.

[13] Annex I ("*Accessibility requirements for products and services*") to DIRECTIVE (EU) 2019/882 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 April 2019 on the accessibility requirements for products and services.

[14] As it is written now, the digital euro is meant to be accessible only for persons with disabilities, while it must have usage features that take care of persons with functional limitations or limited digital skills, older persons and, again, persons with disabilities.

5.2.2 Design of the digital euro – Article 22(2), (3), (4) and (5) Proposal

The rest of Article 22 of the Proposal addresses use aspects of the digital euro and key requirements for the relationship between digital euro users and PSPs. Thus, point 2[15] specifies that users of the digital euro do not need to have or open non-digital euro payment accounts or accept other non-digital euro products to access digital euro payment services, points 3[16] and 4[17] determine that each digital euro payment account must have a unique digital euro payment account number and can be linked to one or more non-digital euro payment accounts,[18] and point 5[19] enables the possibility of using a digital euro payment account by more than one digital euro user.

The European legislator prevents PSPs from requesting digital euro users to have or to open non-digital euro payment accounts or accept other non-digital euro products when accessing it[20] in an express attempt to ensure the freedom of access to the digital euro, as well as its independence as a means of payment, both objectives that have been introduced throughout the Proposal.[21] Despite what is described there, the digital euro cannot be considered a direct competitor of the classic payment accounts offered by credit institutions because of the known limitations laid down by the Proposal to avoid an undesired competition.[22]

Points 3 and 4 of the Article contribute to clarify the technical design and basic functionalities that concern digital euro payment accounts. In particular, point 3 confirms that each digital euro payment account can be identified by a unique identifier, the digital euro payment account number,[23] which is invariable and minimises management difficulties in the digital euro settlement infrastructure's database. However, despite its

[15] See Article 22, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[16] See Article 22, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[17] See Article 22, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[18] With the exception of waterfall and reverse waterfall functionalities presented in Article 13, point 4, of the Proposal. The rationale for this choice has been already addressed in Chapter 4.

[19] See Article 22, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[20] See *supra* note 15.

[21] See the contents of Chapter 5 ("*Technical features of the digital euro*") of the Thesis.

[22] See subsection 3.2.3 "*Limits to the use of the digital euro as a store of value - Article 16 Proposal*" in Chapter 3 of the Thesis.

[23] See "*Digital euro payment account number*" in the *Glossary*.

best efforts in this direction, the current design choice is at stake.[24] For its part, point 4 of the Article confirms that any digital euro payment account may be linked to one or more non-digital euro payment accounts designated by the user, although only one will be usable for the purpose of waterfall and reverse-waterfall functionalities.[25] [26] While this provision may seem to clash with that of Article 13, point 4, of the Proposal it is in line with the intentions of the regulator: waterfall and reverse-waterfall utilities may only work for a given non-digital euro payment account.[27] However, a user may manually add funds to her digital euro payment account using different non-digital euro accounts, which can be linked through the front-end service for easier access.

Finally, point 5 of Article 22 confirms that PSPs must allow the use of digital euro payment accounts by more than one user. This provision, which is in line with Articles 13, point 7,[28] and 16, point 7,[29] of the Proposal,[30] enables users in the same way other equivalent private means of payment do. However, since digital euro payment transactions are subject to PSD2,[31] [32] users need to consider the implications of allowing other users to use their digital euro payment account when it comes to due diligence. PSD2 expects users to adequately authorise others to use their means of payment, subject to the impossibility to refund the owner on the grounds of undue diligence.[33]

[24] See point 4.2 to the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). The European Central Bank has underlined the difficulties that arise concerning the use of "*account identifier*", "*digital euro payment account number*" and "*user alias*", consequently proposing amends to the Proposal that unify the use of each term.

[25] See Article 13, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[26] See subsection 4.2.3.3 "*Waterfall and reverse-waterfall functionalities - Article 13(4)*" in Chapter 4 of the Thesis.

[27] *Id*. What may not be sufficiently justified enough is the regulator's choice of only allowing the waterfall and reverse-waterfall functionalities to work with a given non-digital euro payment account, yet it does not compromise the rationale for Article 22 of the Proposal.

[28] See Article 13, point 7, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[29] See Article 16, point 7, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[30] See subsection 3.2.3.2.2.3 "*Limits on multiple accounts / An account owned by multiple people - Articles 16(6) and 16(7) Proposal*" in Chapter 3 of the Thesis. The analysed rationale for multiple owners of a digital euro payment account is shared with a single user owning multiple accounts.

[31] See Article 5 ("*Applicable law*"), point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[32] Directive (EU) 2015/2366 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (PSD2).

[33] See Raya-Quero, D. (2020). La diligencia de los usuarios y el papel de la biometría en la Directiva (UE) 2015/2366. *Diario La Ley*, (9742).

5.2.3 Online and offline payment transactions – Article 23 Proposal

Article 23, point 1, of the Proposal specifies that the digital euro must be available for both online and offline payment transactions from the time of its first issuance.[34] Point 2 requires that both manifestations of the digital euro, online and offline, must be convertible at par value upon the request of users.[35] For its part, point 3 establishes that, before initiating a proximity payment transaction, both the payer and the payee must be informed whether the transaction will occur online or offline.[36]

Despite being hinted previously throughout the Proposal,[37] online and offline digital euro transactions are only regulated in Article 23. To differentiate each type, the Proposal uses the associated settlement:[38] [39] in the case of online transactions,[40] the settlement takes place in the digital euro settlement infrastructure;[41] in the case of offline transactions, the settlement takes place in the local storage devices of both payer and payee.[42] Aside from that, online digital euro payment transactions are designed for internet payments and offline digital euro payment transactions are designed for payments in proximity.[43]

According to Article 23, point 1, both online and offline modalities of the digital euro will be deployed together and they shall be available as of the first issuance of the digital euro.[44] This asseveration becomes of relevance because the European legislator had not addressed a different scenario anywhere in the Proposal, not even in its Chapter II ("*Establishment and issuance of the digital euro*"). However, despite such explicit consideration, the European Central Bank has curbed slightly the expectations

[34] See Article 23, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[35] See Article 23, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[36] See Article 23, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[37] Aside from Article 2 ("*Definitions*") of the Proposal, the first straight reference to online and offline transactions appears in Article 8 ("*Territorial scope of legal tender status*")

[38] See Article 2, points (14) ("online digital euro payment transaction") and (15) ("*offline digital euro payment transaction*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[39] See also subsection 3.2.3.2.2.1 "*Online vs. Offline limits - Article 16(4) Proposal*˝ in Chapter 3 of the Thesis because of the differences that exist in holding limits for each type, which also take this into consideration.

[40] See "*Offline digital euro payment transaction*" in the *Glossary*.

[41] See "*Digital euro settlement structure*" in the *Glossary*.

[42] See "*Online digital euro payment transaction*" in the *Glossary*.

[43] See subsection 5.2.3.1 "*The special consideration for transactions in a proximity payment – Article 23(3) Proposal*" below, as this is not always the case despite the intended design of the online digital euro.

[44] See *supra* note 34.

surrounding the implementation of the offline digital euro. In particular, the monetary authority of the euro area has acknowledged that it is committed to delivering both the online and offline digital euro models as from the first issuance of the digital euro, yet it envisions difficulties that may recommend postponing the issuance of the offline counterpart, to ensure adequate reaction.[45] This statement may clash with the current state of development of the Proposal, which had augured an adequate evolution recently, in line with the proposed timeline for the project.[46]

For its part, the provision in Article 23, point 2, concerning the convertibility at par between online and offline digital euros requires being analysed, as it is likely redundant. Reviewing Chapter III ("*Legal tender*") and Article 13, point 5,[47] of the Proposal ensures that the provision stated here was applicable already. This consideration could be relevant should the digital euro in its both manifestations, online and offline, be considered different instruments.[48] However, nothing in the Proposal, not even this Article, enables that rationale. Consequently, the wording here might be just an express intent by the European legislator to ensure the population see that both modalities are the same, with no differences in terms of rights conferred to them when using the digital euro.

Finally, the express reference to convertibility at par between online and offline digital euro "*at the request of the digital euro users*"[49] suggests instantaneous interaction. Despite being addressed in Article 30 of the Proposal,[50] instant settlement for both modalities is heavily implied in this provision. It is worth noting that convertibility requires internet connection, while settlement does not require it for offline transactions.

[45] See point 13.3 to the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).

[46] See *Progress on the investigation phase of a digital euro – fourth report*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/euro/digital_euro/progress/shared/pdf/ecb.degov230713-fourth-progress-report-digital-euro-investigation-phase.en.pdf. Published in April 2023. Last accessed on September 20, 2024.

[47] See Article 13, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[48] See section 2.5 "*Interaction between the digital euro and euro banknotes and coins – Article 12 Proposal*" in Chapter 2 of the Thesis. Should the online and offline manifestations of the digital euro be considered different instruments and, therefore, different CBDCs, this provision would be necessary to ensure the homogeneity and its proper interaction and convertibility. However, the digital euro is to be considered as a single CBDC with two different manifestations, online and offline. There are no differences whatsoever in terms of the three functions of money as studied in Chapter 2 of the Thesis.

[49] See *supra* note 35.

[50] See subsection 5.3.6 "*Settlement of digital euro payment transactions – Article 30 Proposal*" below.

5.2.3.1 The special consideration for transactions in a proximity payment – Article 23(3) Proposal

Considering what has been pointed out in the previous sub-section, the main difference aside from the existence of different holding limits[51] between online and offline digital euro payments can be found in the settlement of the transaction, and no other distinctions are expressly made to differentiate them. However, the Proposal does not address in Chapter VII what makes a transactions qualify as "*online*" or "*offline*", requiring abstraction throughout the whole text and the Recitals to understand the whole picture.[52] Nevertheless, it can be expected that online digital euro payments are used for online transactions, while offline digital euro payments are used for interactions in proximity. However, this is not the whole picture.

While Article 30 of the Proposal[53] addresses the settlement of online and offline digital euro transactions, without making any additional differentiations, Article 23, point 3, introduces an additional consideration, which may appear as a contradiction to the above introduced analysis: some transactions in a proximity payment may be settled online instead of offline.[54] Thus, the Proposal introduces the consideration on transactions in a proximity payment that require to be settled online, although the European legislator is neither clear nor explicit about this scenario. There are several cases in which this consideration might be of application, namely transactions that exceed the specific holding limit set for offline transactions,[55] transactions that may need to be prevented because of AML/CFT measures,[56] individuals subject to sanctions,[57] or user whose access to the digital euro is limited because of geographical reasons. It is not the absence of cases in which this scenario may apply which result in scepticism towards the aptitude of the legislator: it is the fact that there is only one explicit reference throughout the Proposal to this particular modality of payment and it may be overlooked despite its impact.[58]

[51] See *supra* note 22.

[52] See Recital (34) to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Users must be able to choose whether to use the online or offline digital euro.

[53] See *supra* note 50.

[54] See *supra* note 36.

[55] See *supra* note 50.

[56] See section 6.7 "*Anti-Money Laundering – Chapter IX – Article 37 Proposal*" in Chapter 6 of the Thesis.

[57] See subsection 5.2.3.1 "*The special consideration for transactions in a proximity payment – Article 23(3) Proposal*" below.

[58] See section 6.2 "*Privacy and digital payments*" in Chapter 6 of the Thesis. This provision impacts in the preferences of digital euro users. Since privacy in payments is one of the most important characteristics,

5.2.4 Conditional digital euro transactions vs. Programmable money – Article 24 Proposal

The tension between CBDC and crypto-assets has already been pointed out in this work before, as some characteristics and intended use may be common for both, yet they are usually addressed as opposites.[59] The Proposal offers a design for the digital euro that maximises the available technology and provides useful solutions to current needs of the population when it comes to digital payments. However, some of the overlapping characteristics between the digital euro and certain crypto-assets aimed at functioning as a means of payment under the Markets in Crypto-assets Regulation (MiCA)[60] could have been determined in a clearer fashion, as it happens with the conditional digital euro transactions laid out in Article 24 of the Proposal.[61]

This section is structured as follows: first, the content of Article 24 of the Proposal is addressed. Second, conditional digital euro payment transactions are distinguished from programmable money, considering all relevant references made throughout the Proposal. Finally, new manifestations of conditional digital euro payment transactions as considered in the Proposal are analysed to determine the novelty associated to their implementation and whether there is an improvement over existing technology on digital payments, as affirmed in the Proposal.

5.2.4.1 Conditional digital euro payment transactions

Article 24, point 1, of the Proposal[62] determines that the European Central Bank must ensure that PSPs and digital euro users can use conditional digital euro payment transactions.[63] To do so, the monetary authority may adopt detailed measures, rules and

the lack of transparency of the Proposal in what seems to be an obvious limitation of the scope of offline digital euro transactions may result in the rejection of the population.

[59] See section 1.1 "*Current legal context on digital payments*" in Chapter 1 of the Thesis.

[60] Regulation (EU) 2023/1114 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 31 May 2023 on markets in crypto-assets (MiCA).

[61] See Article 24 ("*Conditional digital euro payment transactions*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[62] See Article 24, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[63] See "*Conditional digital euro payment transaction*" in the *Glossary*.

standards in accordance with Article 5, point 2, of the Proposal[64] [65] that PSPs can use to ensure interoperable conditional digital euro payment transactions,[66] and provide the functionalities in the digital euro settlement infrastructure necessary for the execution of conditional digital euro payment transactions, including for the reservation of funds.[67] In addition to that, the Proposal establishes in point 2 to the same article that the digital euro shall not be programmable money.[68] [69]

The inclusion of conditional digital euro payment transactions in the Proposal is meant to provide state-of-the-art payment technology to digital euro users, although its features are heavily qualified in the Proposal. Thus, considering the definitions provided for both conditional digital euro payment transactions and programmable money in Article 2 of the Proposal,[70] digital euro users may expect a functionality that is closer to the realm of conditional arguments rather than to automatic transactions that employ non-fungible economic units. This differentiation is addressed in the next subsection.[71]

The article references a reservation of funds functionality, although no definition is included in the Proposal, despite its apparent necessity for the safe provision of conditional payment services according to the European Central Bank.[72] In any case, it may be infer from the content of the Proposal[73] that a reservation of funds functionality entails the

[64] See Article 5, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[65] Article 5, point 2, of the Proposal points out that the digital euro is set to be governed also by the detailed measures, rules and standards that may be adopted by the European Central Bank pursuant to its own competences. Consequently, the express reference included here is not required to make those measures binding, since they will be adopted from valid competences authorised to the European Central Bank by the Treaties, yet is reinforces the idea that they will be applicable and they must be considered when addressing conditional digital euro payment transactions, especially after considering its infra-development in this Proposal.

[66] See Article 24, point 1, letter a), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[67] See Article 24, point 1, letter b), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[68] See Article 24, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[69] See "*Programmable money*" in the *Glossary*.

[70] See Article 2, points 17 ("*conditional digital euro payment transaction*"), and 18 ("*programmable money*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Thus, "*conditional digital euro payment transaction*" means a digital euro payment transaction which is instructed automatically upon fulfilment of pre-defined conditions agreed by the payer and by the payee, and "*programmable money*" means units of digital money with an intrinsic logic that limits each unit's full fungibility.

[71] See subsection 5.2.4.2 "*Contrast to programmable money*" in Chapter 5 of the Thesis.

[72] See section 14.2 "*Conditional payments*" of the 1 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).

[73] See Recital (56) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

possibility of setting aside the funds required for the conditional transaction until the condition, or conditions, are met. Thus, the Eurosystem may adopt standards and application programming interfaces (APIs)[74] to support said reservation of funds and provide an environment in which payer and payee's PSP may be able to check if the set conditions are met. It must be said, however, that the language in the Proposal confirms that this functionality is meant to be developed, yet it will probably not be available at the first issuance of the digital euro,[75] despite the fact the European Central Bank has already acknowledged its utility and has provided cases of use for which it would be essential.[76]

5.2.4.2 Contrast to programmable money

The Proposal explicitly determines that the digital euro shall never be considered as programmable money in its Article 24, point 2,[77] yet it is a recurrent idea throughout the whole legal text.[78] [79] This assertion requires considering the definition provided by the European legislator to programmable money, as the concepts referenced in the Proposal may become misleading should the categories not be adequately addressed.

According to the Proposal, "*programmable money*" means units of digital money with an intrinsic logic that limits each unit's full fungibility.[80] Thus, despite using a name that resembles the concept of smart contract,[81] necessarily linked to crypto-assets, programmable money is described by the European legislator in a fashion that resembles the characteristics of non-fungible tokens.[82] Consequently, what is to criticise may be the selection of language by the European legislator, as it may come as confusing considering the naming convention that alternatives of means of payment, namely crypto-assets, use

[74] See "*Application Programming Interface (API)*" in the *Glossary*.

[75] See *supra* note 73. The European legislator discuss the "*future execution of conditional payment services to digital euro users*."

[76] See *supra* note 73. The European Central Bank identifies use cases such as payment versus delivery and pay-per-use. Should they adequately define APIs able to verify conditions, the reservation of funds functionality would ensure transactions that are virtually risk-free for both payer and payee.

[77] See *supra* note 68.

[78] See, e.g. Recital (55) of the Proposal. Other references are available in the document containing the Proposal.

[79] In addition to the difficulties addressed in this section concerning the naming convention for each of the categories considered, Recital (7) of the Proposal misuses "*programmable payments*" and equates the category to conditional payments. The European legislator should ensure that all references in the Proposal are using the common term to reduce confusion in the reader.

[80] See *supra* note 69.

[81] See "*Smart contract*" in the *Glossary*.

[82] See "*Non-fungible token (NFT)*" in the *Glossary*. The reader must consider that we are dealing with the technical definition of NFT, not the definition usually present among unsophisticated users for which an NFT is linked to the ownership of a concrete copy of a given form of audiovisual manifestation.

to define their own categories.

Setting aside semantic discussions, the Proposal ensures that conditional digital euro payment transactions and programmable money cannot be confused with each other. The European legislator is clearly setting the path in a given direction, because, as it is currently defined in the Proposal, the limitations come from the technological side. For instance, a distributed ledger technology (DLT)[83] [84] settlement infrastructure like the Ethereum[85] blockchain[86] makes possible the existence of programmable money from a token[87] perspective.[88] However, the digital euro settlement infrastructure, being the digital euro an account-based CBDC,[89] could not enable the token-like features needed for that definition of programmable money. However, the functioning for conditional digital euro payment transactions is essentially the same, just considering fungible units of account instead of tokens: whenever a set of conditions is met, a payment is automatically performed. Considering the limitations that are set out by the technology to be used when implementing the digital euro, the European legislator is bringing the best possibility to implement conditional payments only relying in the available environment. This means that conditions will not be checked in the settlement infrastructure, contrary to notable examples of programmable money as described above, which means that there is not such an innovation in terms of digital payments.[90] However, it must be considered that this solution will be implemented in a public digital means of payment for the first time, allowing digital euro users to combine the benefits associated to the use of the CBDC to novelty processes like the one described here.

5.2.4.2.1 The consideration in Recital (7) of the Proposal In addition to the difficulties that arise from the categories described in Article 24 of the Proposal,[91] Recital (7) of the Proposal introduces an additional concern posed by the European legislator when addressing conditional payments. Thus, said Recital states that future developments in

[83] See "*Distributed ledger technology (DLT)*" in the *Glossary*.
[84] See subsection 1.2.2.2 "*Conventional or DLT infrastructure*" in Chapter 1 of the Thesis. DLT settlement infrastructures are considered when addressing the design of a CBDC.
[85] See "*Ethereum*" in the *Glossary*.
[86] See "*Blockchain*" in the *Glossary*.
[87] See "*Token*" in the *Glossary*.
[88] See subsection 1.2.2.3 "*Account-based or token-based*" in Chapter 1 of the Thesis.
[89] See section 1.3 "*The digital euro*" in Chapter 1 of the Thesis.
[90] Digital payments considering conditional scenarios can be set using traditional means of payment available in commercial solutions already in use by PSPs.
[91] See *supra* note 79.

digital payments may affect the role of the single currency in retail payment markets, both within the European Union and internationally, and it points out to the development of other CBDCs that are currently being explored by foreigners central banks and stablecoins[92] not denominated in euro that could displace the euro by satisfying demand for programmable payments, should the digital euro not address the needs of the population accordingly.[93]

While the threat posed by other CBDCs and stablecoins might be real, it needs to be qualified. CBDCs developed by other central banks cannot be denominated in euro by definition. For its part, stablecoins, despite being possible its denomination in euro,[94] are under heavy regulation by MiCA[95] after its entry into force in mid 2023. Consequently, it may come as disproportionate to consider that the lack of adequate development in terms of conditional payment functionalities of the digital euro could affect the role of the euro as an international monetary anchor. The European legislator must ensure that technological advances find its way into the digital manifestation of the single currency, but it must not overstate the consequences to ensure its implementation.

5.2.4.3 *Internet 4.0 payments, yet no programmable money*

In search of technological progress in digital payments, as introduced in the previous sub-section, the Proposal presents the idea of machine-machine payments in the context of Industry 4.0[96] in Recital (4).[97] For its part, Recital (55) of the Proposal develops a range of conditional payment transactions, including payments between machines, where those machines are programmed to automatically trigger payments for a certain set of actions, including the acquisition of spare parts, the selection of favourable market conditions for

[92] See "*Stablecoin*" in the *Glossary*.

[93] See Recital (7) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[94] See *Top Euro Stablecoins Tokens by Market Capitalization*, CRYPTO.COM, retrieved from: https://crypto.com/price/categories/eur-stablecoin. Last accessed on September 9, 2024.

[95] Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937.

[96] See *What are Industry 4.0, the Fourth Industrial Revolution, and 4IR?*, MCKINSEY & COMPANY. Retrieved from: https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-are-industry-4-0-the-fourth-industrial-revolution-and-4ir. Published on August 17, 2022, last accessed on September 9, 2024.

[97] See Recital (4) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

charging and paying electricity, insurance, leasing and maintenance, among others.[98]

While it is an interesting idea that could enable the use of the digital euro in transactions that are still part of the future, yet foreseeable, several questions of law arise without a clear response. For instance, who should be considered as the owner of the digital euro payment account is not addressed in this Proposal. Following up on that query, who should be considered responsible for placing that order, whether the machine or a human person, remains unclear. Only in the event of considering the machine the owner of the transaction we could be discussing these payments as machine-machine transaction in the language of the Proposal, otherwise there would be no difference with the current state of digital payments: users authorise computers to perform transactions, yet those machines are not relevant in terms of rights and obligations.

Prospective users of the upcoming digital euro are living in a world that it is still dealing with the consequences of automatizations powered by Artificial Intelligence (AI), because the legal framework has not yet provided an adequate solution for them.[99] Consequently, it is likely that these possibilities that are enabled for conditional payments will not be available at the first issuance of the digital euro, which is sensible from a regulatory perspective. Hence, the inclusion of explicit references to those capabilities in the Proposal could have been avoided or, at least, toned down, to curb the expectations of potential digital euro users. As Recital (55) addresses, waterfall and reverse-waterfall functions, as regulated in Article 13, point 4, of the Proposal,[100] are also considered conditional digital euro payment transactions, and they entail the most basic conditional perspective imaginable. The current content of the Proposal points in that simple, yet useful, direction at this time of the development of the project.

Despite the observation made in the previous paragraphs, it can be analysed whether machine-machine payments, should they ever be implemented, are adequately suited in the digital euro settlement infrastructure, as they could benefit from alternative infrastructures able to verify the meeting of conditions, such as DLT infrastructures similar to

[98] See *supra* note 78.

[99] See *AI in Management: A 2023 Perspective on a 1979 IBM Slide*, MEDIUM. Retrieved from: https://medium.com/@oneboredarchitect/ai-in-management-a-2023-perspective-on-a-1979-ibm-slide-ef368036fc1a. Published on December 17, 2023, last accessed on September 9, 2024. In 1979, IBM included a slide in one of its presentations that read: "*A computer can never be hold accountable. Therefore*(sic) *a computer must never make a management decision*."

[100] See Recital (55) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

those of Ethereum.[101]

5.3 Modalities of distribution – Section 2 – Chapter VII

For its part, the content of Section 2 of Chapter VII of the Proposal[102] references technical considerations that are required for the issuance and distribution of digital manifestation of the single currency by prospective digital euro users. Thus, Articles 25 to 33 address technological aspects of the implementation of the digital euro, such as front-end services, interoperability of standards, the "*emergency*" switching from one payment service provider to another, and the general fraud detection and prevention mechanism, among others. However, some of the topics addressed in this Section of the Proposal, such as the use of European Digital Identity Wallets in Article 25, or the dispute mechanism described in Article 27, could have been introduced somewhere in the Proposal, as their link to the rest of the technical considerations included is weak to say the least. Accordingly, this section is structured to analyse separately the content of each Article 25 to 33, ensuring an in-depth legal analysis of the implications that may arise from all of them.

5.3.1 European Digital Identity Wallets – Article 25 Proposal

Article 25, point 1, of the Proposal mandates that the digital euro front-end services[103] must be interoperable with or be integrated into the European Digital Identity Wallets.[104] Additionally, point 2 of the article requires PSPs distributing the digital euro to ensure that, upon request, users can utilize the functionalities of their European Digital Identity Wallets in line with Article 6a of the proposed Regulation aimed to establish a framework for a European Digital Identity.[105] [106]

Despite being addressed later in the Proposal,[107] front-end services are referenced in

[101] See subsection 1.2.3 "*Benefits and cases of use for a CBDC*" in Chapter 1 of the Thesis.

[102] See Section 1 ("*Digital euro functionalities*") in Chapter VII of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[103] See "*Front-end service*" in the *Glossary*.

[104] See Article 25, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[105] See Article 25, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[106] See Article 6a of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) No 910/2014 as regards establishing a framework for a European Digital Identity. COM(2021) 281 final.

[107] See subsection 5.3.4 "*Front-end services to access and use the digital euro – Article 28 Proposal*" below.

this Article, requiring a definition. Thus, Article 2, point 20, of the Proposal determines that "*front-end service*" means all components necessary to provide services to digital euro users that interact via defined interfaces with back-end solutions and other front-end services.[108] Consequently, the mandate included in Article 25 determines that front-end services designed for the use of the digital euro[109] must be interoperable with the European Digital Identity Wallets. This raises two different questions: what European Digital Identity Wallets are and what does its implementation entail for accessing and using the digital euro.

European Digital Identity Wallets[110] are means of digital authentication aimed at homogenising the way in which European citizens authenticate themselves when accessing digital services of all kinds.[111] The current landscape for digital authentication in the European Union is far from homogeneous, with Member States having followed different approaches on how to ensure it, yet complying with the eIDAS Regulation.[112] [113] However, it is even more concerning in third countries, which usually rely on private actors to provide these services, evidencing a problem when aligning interests.[114] In this context, the implementation of an authentication system that allows interoperability throughout all Member States is desired by citizens of the European Union, as it brings a safer and more advanced system to ensure identity data is properly stored and used for legit uses.

[108] See Article 2, point 20, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[109] See *supra* note 108. In accordance with Article 28 of the Proposal, the European Central Bank will develop front-end services that will be available for every user by default. PSPs may develop their own front-end services to access and use the digital euro, yet they must ensure that digital euro users may access the digital euro using the ones developed by the European Central Bank.

[110] See "*European Digital Identity Wallets*" in the *Glossary*.

[111] See point 1 ("*CONTEXT OF THE PROPOSAL – Reasons for and objectives of the proposal*") of the Explanatory Memorandum of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) No 910/2014 as regards establishing a framework for a European Digital Identity. COM(2021) 281 final.

[112] See Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC. (eIDAS Regulation.)

[113] See, e.g., *France Identité* in France, *Sistema Pubblico di Identità Digitale* in Italy, *Certificado digital* in Spain or *MyGovID* in Ireland. Despite being compliant with the eIDAS Regulation, these systems are not naturally interoperable, difficulting the authentication of Union citizens outside of their Member State of origin.

[114] See, e.g., the example of the United States of America. While standards are adopted to ensure an adequate implementation of the latest available technology for authentication purposes, no public entities are involved in the provision of services, with only private parties in charge of those tasks. Consequently, there is a market in which providers of authentication services compete for potential users, fragmentating and making difficult to implement interoperability measures. In addition to that, authentication data, which is in essence personal data, is gathered and processed by private actors for their own commercial interests. In all, consumers in said country experience a worse experience when authenticating digitally.

Concerning the use of European Digital Identity Wallets for digital euro purposes, in accordance with the content of the Proposal, users may expect to authenticate its access to digital euro payment services using European Digital Identity Wallets or to access the front-end services for digital euro services directly from the European Digital Identity Wallet.[115] [116] In addition to that, digital euro users may anticipate to benefit from all the functionalities described in Article 6a of the proposed Regulation aimed to establish a framework for a European Digital Identity,[117] which ensures cross-border interoperability of the authentication service and adequate reliance on the authentication data to be verified. While the implementation of the European Digital Identity Wallet comes as an improvement on its own, the benefits associated to its direct connection to the digital euro are not that obvious. On top of that, the principle of technological neutrality that usually binds legislative acts being enacted by the European Union is at stake. To address these concerns, the next sub-section analyses the conundrum, considering the impact of this explicit inclusion in the Proposal, while its effects on the objective of financial and digital inclusion are addressed later in the chapter.[118]

5.3.1.1 Critique – Is this *the best* standard that is available?

The European Union legal acts are usually characterised by the application of the principle of technological neutrality.[119] Thus, an open mind and a preference for general descriptions of a technological solution are preferred instead of overly specific examples that may end up limiting the application of the legal act in the near future when technology has reached new heights not considered initially.[120] However, in this case, the Proposal is

[115] See *supra* note 105.

[116] See Recitals (57) and (58) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Digital euro users shall be able to create a digital euro payments account and authorise digital euro payments, both online and offline, using the European Digital Identity Wallet.

[117] See *supra* note 106.

[118] See subsection 5.3.9.1 "*Critique – The technological progress paradox*" in Chapter 5 of the Thesis.

[119] See point 2.6 ("*Underlying principle 5: technological neutrality and data portability*") of the Annex II to the COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. European Interoperability Framework - Implementation Strategy. COM(2017) 134 final. When establishing European public services, public administrations should focus on functional needs and defer decisions on technology as long as possible in order to minimise technological dependencies, to avoid imposing specific technical implementations or products on their constituents and to be able to adapt to the rapidly evolving technological environment.

[120] See, e.g., Raya-Quero, D. (2021). La diligencia de los usuarios y el papel de la biometría en la Directiva (UE) 2015/2366. Diario La Ley, (9742), 1. Concerning the implementation of the Directive 2015/2366 (Second Payment Services Directive or PSD2,) the original Payment Services Directive (Directive

explicitly including a concrete example of technology to be used to access the digital euro services.[121] Consequently, it is sensible to address whether this action is cautious enough.

Including such an explicit reference to a given technology can only be justified considering the principle of technological neutrality if said example of technology entails the best alternative possible and no other foreseeable development may alter this statement. Considering this, the analysis should focus on the aptitude of the European Digital Identity Wallets to be considered the best technological alternative, including long-term predictions. Otherwise, the provisions included in Article 25 of the Proposal may be rendered futile even before the implementation of the digital euro is nigh. While the previous paragraphs highlight the usefulness derived from the implementation of a homogenous digital authentication system in the European Union, it feels too extreme to include the specific reference to the European Digital Identity Wallets in the Proposal as a means of authentication and use of the digital euro. Far from looking like an example of the best available technology, it feels like an attempt by the European legislator to introduce two novelties in one act, with one trying to support the other in its social acceptance by citizens of the European Union. Consequently, even though the rationale for its implementation is reasonable, and in line with the concerns of the European Central Bank concerning the implementation of the digital euro and the principle of technological neutrality,[122] the analysis performed suggest that such an explicit inclusion should be left outside of the Proposal, not being included in the upcoming Regulation on the establishment of the digital euro.

5.3.2 Interoperability of standards – Article 26 Proposal

Article 26 of the Proposal emphasises the importance of interoperability of standards between digital euro payment services and private digital payment systems.[123] It requires

2007/64/EC) did not adequately considered the technology development for strong customer authentication (SCA), which caused that multi-factor authentication (MFA) methods, including biometrics, could not be of application despite its benefits for security in digital payments. PSD2 used a language that ensured stability in the near future, leaving room for the implementation of new technologies that may improve the existing one.

[121] In fact, the explicit reference refers to a Proposal itself, which worsens the situation: not only a concrete technological example is selected, but the example is also still conditional to approval and entry into force. Legal certainty might be impacted.

[122] See point 3.5 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).

[123] See Article 26, first subparagraph, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

the European Central Bank to strive to ensure that the standards governing digital euro payment services are compatible with those used for equivalent private means of payment.[124] Additionally, the ECB should, where possible and appropriate, enable private digital payment systems to adopt the rules, standards, and processes of the digital euro, something that may be facilitated through the use of open standards.[125]

As it is described, the search for interoperability flows both ways: the European Central Bank must take the best standards coming from private digital means of payment, but it also must try to involve relevant private parties when designing the rules, standards and processes governing the digital euro. This approach is in line with the principle of technological neutrality that characterises the design of regulations in the European Union.[126]

The use of open standards[127] renders an adequate approach to achieve the goal described above. By getting relevant private parties involved in the development of open standards, technological progress is incentivised while costs are reduced throughout the process.[128] Since the European legislator has manifested the importance of improving the quality of the technology involved in the use of the digital euro throughout the Proposal,[129] this actions represents an additional step in the same direction. However, the current state of development of the digital euro shows that, despite the best efforts, it will be a difficult task.[130]

5.3.3 Dispute mechanism – Article 27 Proposal

Article 27 of the Proposal outlines the framework for the dispute mechanism related to digital euro transactions.[131] Point 1 to that article states that disputes will be governed

[124] *Id*.

[125] See Article 26, second subparagraph, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[126] Contrast this approach, which is the usual, to the abnormal situation described in subsection 5.3.1 "*European Digital Identity Wallets – Article 25 Proposal*" above.

[127] See "*Open standard*" in the *Glossary*.

[128] Performing a simple economic analysis of the system here described, should any party develop its own standard and prevent others from using it, resources are wasted and no net-effect is ever acquired, reducing efficiency and, hence, incrementing the global cost for all parties involved.

[129] Notable examples can be found in the Recitals.

[130] See subsection 5.3.9 "*Fair, reasonable and non-discriminatory access to mobile devices – Article 33 Proposal*" below. Original manufacturers of equipment are not always willing to comply with the technical requirements laid down in this Proposal, we may expect even less when there is no explicit mandate and just an invitation to collaborate, as it is the case in Article 26 of the Proposal.

[131] See Article 27 (“*Dispute mechanism*”) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

by Directive 2015/2366,[132] [133] while Directive (EU) 2020/1828[134] will apply to representative actions against violations of this Regulation that affect consumers' collective interests.[135] In accordance with point 2, the European Central Bank and national central banks may offer mechanisms to facilitate message exchanges between payment service providers for dispute resolution. These mechanisms can be operated directly by the European Central Bank or by designated support service providers.[136] [137] Finally, point 3 determines that the European Central Bank will not act as a party in any of these disputes.[138]

As stated in the previous paragraph, point 1 to Article 27 determines that disputes shall be governed by PSD2.[139] Accordingly, the content of Chapter 6 ("*ADR procedures for the settlement of disputes*") of PSD2[140] must be considered when addressing complaints, disputes and alternative dispute resolution (ADR) procedures concerning digital euro payment transactions. By forwarding this regulation to PSD2, the Proposal is making explicit the application of said Directive, yet it was not needed: digital euro payment transactions fit in the type of payment services considered in Articles 1, 2, and 3 of PSD2.[141] While disputes concerning the lawfulness of the processing of personal data

[132] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC.

[133] With the exception of disputes regarding the lawfulness of personal data processing, which will remain governed by Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation or GDPR.)

[134] Directive (EU) 2020/1828 of the European Parliament and of the Council of 25 November 2020 on representative actions for the protection of the collective interests of consumers and repealing Directive 2009/22/EC (Representative Actions Directive.)

[135] See Article 27, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[136] See Article 27, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[137] See section 6.6 "*Processing by providers of support services – Article 36 Proposal*" in Chapter 6 of the Thesis.

[138] See Article 27, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[139] The Proposal references the Second Payment Services Directive (PSD2) here, despite referencing the Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on payment services and electronic money services in the Internal Market amending Directive 98/26/EC and repealing Directives 2015/2366/EU and 2009/110/EC (Third Payment Services Directive or PSD3) in its Article 5. The European legislator is encouraged to unify the references to avoid complexity for the reader.

[140] See Chapter 6 ("*ADR procedures for the settlement of disputes*"), sections 1 ("*Complaint procedures*") and 2 ("*ADR procedures and penalties*"), of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC.

[141] See Articles 1 ("*Subject matter*"), 2 ("*Scope*"), and 3 ("*Exclusions*") of Directive (EU) 2015/2366 of the

that shall be governed by GDPR,[142] the Proposal addresses that representative actions against infringements that harm collective interests of consumers are governed by the Representative Actions Directive,[143] which is sensible considering that the aim of said Directive is to ensure that consumers are able to protect their collective interests in the European Union via representative actions.[144]

For its part, Article 27, point 2, states that mechanisms for PSPs to facilitate the exchange of messages for the resolution of disputes may be made available by the European Central Bank and the national central banks.[145] As described, the proposed mechanisms resemble the Online Dispute Resolution (ODR) platform enabled by the Union's authorities for consumers acquiring goods and services in the European Union.[146] In addition to that, providers of support services,[147] whose existence is conditional according to Article 35, point 7,[148] [149] are introduced in the Proposal as the likely operators of the mechanisms for the exchange of messages previously referenced.[150]

Finally, point 3 to Article 27 establishes that the European Central Bank shall not act as a party in any of the disputes referred to in points 1 and 2 of the article.[151] This assertion is in line with the content of other provisions in the Proposal,[152] which confirms that the European Central Bank does not act as a party at any of the disputes that may arise concerning the digital euro, despite owning the settlement infrastructure, because distribution of the digital euro depends on PSPs and the development of front-end services does not enable customer rights to the end users, as declared in the Proposal. However,

European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC.

[142] See sections 6.3 "*Chapter VIII of the Proposal: Privacy and Data Protection*", 6.4 "*Data processing by PSPs – Article 34 Proposal*", 6.5 "*Processing by the ECB and national central banks – Article 35 Proposal*", and 6.6 "*Processing by providers of support services – Article 36 Proposal*" in Chapter 6 of the Thesis.

[143] See *supra* note 134.

[144] *Id*.

[145] See *supra* note 136.

[146] *Online Dispute Resolution*, European Commission. Accessible at: https://ec.europa.eu/consumers/odr/main/. Last access on September 10, 2024.

[147] See "*Providers of support services*" in the *Glossary*.

[148] See Article 35, point 7, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[149] See subsection 6.6.2 "*Concerning Article 35(7)*" in Chapter 6 of the Thesis.

[150] Should the European Central Bank and the national central banks decide not to confer this task to the providers of support services, the European Central Bank shall operate the mechanisms on its own.

[151] See *supra* note 138.

[152] See subsections 4.2.5 "*Legal relationship between the European Central Bank, PSPs and digital euro users - Article 13(6) Proposal*" in Chapter 4 of the Thesis and 5.3.4 "*Front-end services to access and use the digital euro – Article 28 Proposal*" below.

the statement made in this provision is not absolute and requires qualification because of the lack of a definition for "*dispute*."[153] Thus, it can be argued that the European Central Bank may act as a party at disputes that arise concerning malfunctions in the digital euro settlement infrastructure[154] as well as those that may arise regarding irregular processing of personal data pursuant to the content of Articles 35 and 36 of the Proposal.[155] [156]

5.3.4 Front-end services to access and use the digital euro – Article 28 Proposal

Article 28 of the Proposal sets out requirements for the front-end services that allow users to access and use digital euro payment services.[157] Point 1 mandates that payment service providers distributing the digital euro must offer users the choice between front-end services developed by the providers themselves and those developed by the European Central Bank.[158] However, according to point 2, the European Central Bank's front-end services will not establish customer relationships, which remain the responsibility of payment service providers under Directive 2015/2366[159] and the digital euro distribution rules.[160] Finally, point 3 determines that PSPs must also ensure that digital euro services display the official digital euro logo and that digital euro accounts are easily accessible and usable by users.[161]

Despite providing a definition for front-end services, the Proposal does not adequately clarity what is being regulated in Article 28. Described as "*all components necessary*

[153] The references made to the concept "*dispute*" in points 1 and 2 of Article 27 of the Proposal are vague, consequently remaining unclear its scope.

[154] See subsection 4.2.5 "*Legal relationship between the European Central Bank, PSPs and digital euro users - Article 13(6) Proposal*" in Chapter 4 of the Thesis.

[155] See sections 6.5 "*Processing by the ECB and national central banks – Article 35 Proposal*" and 6.6 "*Processing by providers of support services – Article 36 Proposal*" in Chapter 6 of the Thesis.

[156] Disputes concerning the lawfulness of the processing of personal data are to be governed by GDPR, as stated in number 1 of Article 27. However, the language in point 3 of the Article may cause the reader to infer that the European Central Bank cannot act as a party in a dispute that arises regarding that topic, which is incorrect. The European legislator may consider a reformulation of the assertion in point 3 of Article 27 of the Proposal, accordingly.

[157] See Article 28 ("*Front-end services to access and use the digital euro*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[158] See Article 28, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[159] See *supra* note 132.

[160] See Article 28, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[161] See Article 28, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

to provide services to digital euro users that interact via defined interfaces with back-end solutions and other front-end services",[162] front-end services may be approximated to the user interface that enables users to access all digital euro services as described in Annex I of the Proposal.[163] The current definition does not satisfy neither a technical operator nor a standard user of the digital euro, hence a revision might be encouraged.[164]

Article 28, point 1,[165] demands PSPs to provide digital euro users with the choice of using either the proprietary front-end services developed by the PSP itself or the front-end services developed by the European Central Bank. While this mandate enables users to device which front-end services they prefer to use, it also creates an incentive for PSPs to improve the technology offered: should the private alternative be worse than the public one, user would always choose the latter. Consequently, PSPs are interested in developing better front-end services that may convince users to use theirs instead.[166] Additionally, point 1 of the Article, it states that any PSP who decides not to develop its own front-end services must use the ones developed by the monetary authority. This ensures equal access to any PSP in the distribution of the digital euro. Not only those PSPs who invest the most in creating innovative front-end services can compete, as any PSP may provide services independently linking to the European Central Bank's front-end, which is an adequate measure.[167]

For its part, Article 28, point 2, of the Proposal reinforces an idea that was introduced in Article 13, point 6.[168] [169] Similar to the provision in that article, those front-end services provided by the European Central Bank, as described above, will not generate customer

[162] See Article 2, point 20, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[163] See "*Front-end service*" in the *Glossary*.

[164] Despite being a technical feature of the digital euro, the content of Article 28 of the Proposal does not provide any technical insight that may help understand the final design of the digital euro. Article 28 provides a general description of what can users expect from the front-end services and it also incorporates some relevant mandates for PSPs. However, as it is written at this moment, it fails to represent what is meant to regulate.

[165] See *supra* note 158.

[166] The direct benefit for PSPs comes with data usage that may be processed via a proprietary front-end system as well as marketing-oriented design choices.

[167] As it has been pointed out throughout the Thesis, the Proposal ensures the involvement of as many actors as possible in the issuance and distribution of the digital euro offering incentives, instead of demanding their participation, with the exception of credit institutions as seen in subsection 4.3.1.3 "*Credit institutions that shall provide the basic digital euro payment services – Article 14(1), Annex I PSD2 and Article 14(3) Proposal*" in Chapter 4 of the Thesis.

[168] See Article 13, point 6, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[169] See subsection 4.2.5 "*Legal relationship between the European Central Bank, PSPs and digital euro users - Article 13(6) Proposal*" in Chapter 4 of the Thesis.

relationships between users and the monetary authority.[170] Customer relationships, consequently, will only be provided by PSPs as distributors of the digital euro. In addition to that, this provision confirms that the European Central Bank will not have access to any personal data concerning those front-end services it has developed yet are used by PSPs.[171] The most obvious consequence of this affirmation is to infer the opposite: PSPs may have access to personal data that can be gathered via the proprietary front-end services they have developed.[172] In any case, the Proposal limits the amount of data, as well as its type, that can be processed by PSPs in Article 34.[173] [174]

Finally, point 3 to Article 28 of the Proposal introduces two recommendations,[175] however not in the best terms. While letter a) references an official digital euro logo that has not been unveiled yet,[176] letter b) imposes no real obligation to either the PSPs involved in the digital euro payment transactions or the European Central Bank.[177] Consequently, a revision of this provision is encouraged.

5.3.5 Verification of sanctions – Article 29 Proposal

Article 29 of the Proposal outlines the obligations of PSPs to comply with sanctions arising from the European Union under Article 215 TFEU.[178] According to point 1, PSPs must verify whether any of their digital euro users are listed persons or entities subject to sanctions, conducting these checks immediately after new or amended restrictive measures come into force and at least once daily.[179] Point 2 determines that, during the execution of a digital euro payment transaction, the payer's and payee's PSPs are not

[170] See *supra* note 161.
[171] See section 6.4 "*Data processing by PSPs – Article 34 Proposal*" in Chapter 6 of the Thesis.
[172] See *supra* note 166.
[173] See *supra* note 171.
[174] It must be said, however, that proprietary front-end services may end up tricking users into thinking they require a non-digital euro account to user waterfall functionalities, despite not being the case according to the Proposal. The European legislator is encouraged to reinforce this provision to prevent this misleading behaviour that may emanate from certain PSPs.
[175] See *supra* note 161.
[176] As of August 2024, the only references to the digital euro official logo are this Proposal and the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34).
[177] Ensuring that "*digital euro payment accounts can be quickly and easily accessed to and used by digital euro users*" is an empty statement.
[178] See Article 29 ("*Compliance with Union sanctions adopted in accordance with Article 215 TFEU*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[179] See Article 29, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

required to conduct additional checks beyond those mandated in the previous point.[180] If a PSP fails to perform the required verifications and subsequently executes a transaction that leads another PSP to violate sanctions by not freezing assets or by making funds or resources available to listed persons or entities, the PSP responsible for the oversight will be liable to compensate the other PSP for any financial penalties incurred as a result.[181]

Despite its location in Chapter VII of the Proposal, this provision is barely technical. It is true that it points out to a technical verification of limitations that PSPs must perform with digital euro users,[182] however it is necessarily linked to the topic of distribution and limits, which are addressed elsewhere in the Proposal.[183] A change in the location of this Article might be encouraged considering this analysis.

In any case, it remains true that limits on the use of the digital euro may not arise from the contents of Article 14 of the Proposal. Thus, Article 29, point 1,[184] by making express reference of Article 215 TFEU,[185] introduce a mandate to PSPs to verify whether any of their digital euro users are listed persons or entities subject to restrictive measures adopted in accordance with Article 215 TFEU (in particular, asset freeze or prohibition of making funds or economic resources available.) This verification must be performed at least daily but it is expected that PSPs performed it immediately after its entry into force. In addition to this, the Proposal remarks the need to ensure that any restrictive measures that are adopted in accordance with Article 215 TFEU should be in line with Regulation (EU) 2016/679 (GDPR) as said measures require to be proportionate and necessary.[186]

While the timeframe described in point 1 of the Article can be considered as reasonable,[187] it could not be enough to prevent all unwanted transactions, considering the

[180] See Article 29, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[181] See Article 29, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[182] The technical aspect of said verification is not addressed on Article 29 of the Proposal. It imposes an obligation of control to PSPs, yet the process or the implications in the digital euro settlement infrastructure are not defined nor addressed in the provision.

[183] See Chapters 3 ("*The digital euro as a store of value and as a means of payment*") and 4 ("*Distribution of the digital euro*") of the Thesis.

[184] See *supra* note 179.

[185] See Article 215 of the Treaty on the Functioning of the European Union.

[186] See Recital (74) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. This consideration could have been made explicit in Article 29, yet it is not required because of the contents of Article 5 ("*Applicable law*") of the Proposal.

[187] See, e.g., Council Decision 2014/145/CFSP of 17 March 2014 concerning restrictive measures in respect of actions undermining or threatening the territorial integrity, sovereignty and independence of Ukraine, and Council Decision (CFSP) 2022/1530 of 14 September 2022 amending Decision 2014/145/CFSP

content of point 2 of Article 29: neither the payer's nor the payee's PSPs should perform any additional checks to confirm whether any of the involved parties are listed persons or entities described in the previous point.[188] Consequently, any transaction performed by listed individuals or entities after the entry into force of the measure pursuant Article 215 TFEU, should the daily verification be performed later, could be completed bypassing the sanction. This could be prevented by performing an additional check at the beginning of the transaction. However, the European legislator has made express its intention of avoiding this additional layer of verifications. The rationale is likely to be found in efficiency: the additional checks that would be needed to perform any transaction would overcharge the digital euro settlement structure and would compromise the objective of achieving instant settlement.[189] The chosen design for this process ensures minimal concerns on the topic of sanctions.[190] [191]

Finally, Article 29, point 3, imposes a reasonable damage calculation rule for PSPs that fail to carry out the verifications described previously in the Article.[192] Whenever the lack of diligence of a PSP when addressing said verifications result in a failure of other PSP to comply with the sanctions, the first shall compensate the latter for the financial damage caused that may arise from penalties imposed or the loss of the frozen funds.[193]

concerning restrictive measures in respect of actions undermining or threatening the territorial integrity, sovereignty and independence of Ukraine. Both decisions involve asset freeze whose entry into force is the following day to its publication in the Official Journal of the European Union. The timeframe described in Article 29 is aligned with the standard procedure set in the European Union.

[188] See *supra* note 180.

[189] See subsection 5.3.6 "*Settlement of digital euro payment transactions – Article 30 Proposal*" below.

[190] In addition to efficiency, it is also worth mentioning that digital euro payment transactions are subject to holding limits pursuant to Article 16 of the Proposal. Thus, any transaction that may escape the verification as described here would amount to a small quantity, not jeopardising the main objective of the imposed sanction.

[191] Also, see the rationale for Article 29, point 3, of the Proposal below.

[192] See *supra* note 181.

[193] An impacted transaction could be as follows: a sanctioned user uses PSP1's services to conduct a digital euro transaction. PSP1 does not carry out the required verifications pursuant to Article 29 of the Proposal. Said transaction consists of the transference of frozen funds from PSP1 to a different digital euro user who uses PSP2's services. The relevant authorities in the European Union request PSP2 to freeze out those assets, experiencing a loss, and impose a penalty. Since the result can be linked to PSP1's lack of diligence, PSP2 is entitled to request a compensation to PSP1, including both the funds lost and the penalty suffered.

5.3.6 Settlement of digital euro payment transactions – Article 30 Proposal

Article 30 of the Proposal specifies the settlement of digital euro payment transactions.[194] Thus, point 1 mandates that both online and offline digital euro transactions must be settled instantaneously.[195] For online transactions, the final settlement occurs when the transfer of digital euros from the payer to the payee is recorded in the digital euro settlement infrastructure approved by the Eurosystem, according to point 2.[196] Finally, for offline transactions, final settlement takes place when the digital euro holdings are updated in the local storage devices of both the payer and payee as determined by point 3.[197]

The settlement of the payment transactions constitutes one the most important provisions in the Proposal, as it determines the validity and final consideration of the transaction. Settlement of digital euro payment transactions is expected to be instantaneous, according to the language used in point 1 of Article 30.[198] In line with Recital (64) of the Proposal, instantaneous settlement can be equated to "*in a few seconds only, in normal circumstances*."[199] This definition ensures the achievement of instant payments[200] in the context of the SEPA Instant Credit Transfer scheme launched in 2017,[201] and TARGET Instant Payment Settlement (TIPS),[202] although making available for the general public and for free its benefits. This definition allows to consider the digital euro to comparable means of payment based on instant payments, who are in its entirety private offerors.[203]

[194] See Article 30 ("*Settlement of digital euro payment transactions*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[195] See Article 30, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[196] See Article 30, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[197] See Article 30, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[198] See *supra* note 195.
[199] See Recital (64) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[200] See "*Instant payment*" in the *Glossary*.
[201] See *What are instant payments?*, European Central Bank – Eurosystem. Retrieved from: https://www.ecb.europa.eu/paym/integration/retail/instant_payments/html/index.en.html. Last accessed on August 16, 2024.
[202] See *What is TIPS?*, European Central Bank – Eurosystem. Retrieved from: https://www.ecb.europa.eu/paym/target/tips/html/index.en.html. Last accessed on August 16, 2024.
[203] Notable examples include Bizum, Venmo, Visa CashApp, MoneyGram or Stripe.

The modality of the digital euro payment transaction impacts the settlement of the transaction, hence the need to address them separately. This section offers now two sub-sections addressing the differences between the settlement of online and offline digital euro payment transactions and an analysis of the enhancements associated to its implementation.

5.3.6.1 Online vs. offline settlement

Article 30, point 2, of the Proposal states that the final settlement of online digital euro payment transactions shall occur at the moment of recording the transfer from the payer to the payee in the digital euro settlement infrastructure approved by the Eurosystem.[204] Online transactions, whether over the internet or in proximity,[205] are only final when they are registered in the settlement infrastructure. When a digital euro payment transaction is considered as final it cannot be reversed.[206] The consequence on the moment considered to settle the transaction is relevant because it does not matter whether one or both users experience lag during the payment transaction and the settlement infrastructure is unable to register it instantaneously: the registration in the settlement infrastructure will define the extinction of the payment obligation, not the moment of the transaction.[207]

For its part, Article 30, point 3, of the Proposal determines that the final settlement of offline digital euro payment transactions shall occur at the moment when the records incorporated[208] in the local storage devices of the payer and payee are updated. The rationale in this provision follows the same on the previous paragraph, requiring that both devices are adequately updated for the instant payment transaction to be final. Since the provision requires that both devices, the payer's and the payee's, are updated, it may be inferred that unsuccessful transactions that cannot be updated on both devices will fail, being cancelled and therefore not final. Doing so, the European Union authorities minimise duplication issues and other fraud actions for which the Proposal seems to be

[204] See *supra* note 196.

[205] See subsection 5.2.3.1 "*The special consideration for transactions in a proximity payment – Article 23(3) Proposal*" in Chapter 5 of the Thesis.

[206] See subsection 5.3.8 "*General fraud detection and prevention mechanism – Article 32 Proposal*" below. This assertion is true, unless fraud is present in the transaction.

[207] It could be argued that a *bona fide* payer could avoid legal consequences of an overdue payment should she justify that she complied with everything to perform the payment on time, the available information displayed to her on the front-end led to think that the transaction was final, yet it was not. However, this is a question of civil law that would require an individual analysis for each Member State.

[208] Article 30, point 2, of the Proposal uses "*concerned*" instead of "*incorporated*". The choice of words made here is meant to ease the reader, although the meaning remains the same.

overlooking.[209] [210]

Since offline digital euro payment transactions are settled outside the digital euro settlement infrastructure, directly in the storage devices involved, updating the holding records online does not affect the validity of the transaction. However, it is relevant concerning the online holding limit that affects the digital euro user.[211] As defined in Article 16, point 4, of the Proposal[212] the online holding limit is equal to the difference between the overall holding limit and the offline holding limit.[213] Consequently, any digital user whose offline digital euro holding records have not been updated accordingly will have a reduced online holding limit.[214]

The matter of settlement is also of relevance when addressing AML/CFT measures in the Proposal. Accordingly, its analysis will be performed later in Chapter 6.[215]

5.3.6.2 Improvements over the existing settlement technology

The implementation of the digital euro comes as an attempt from the European Union authorities to improve the digital payments landscape by making new technologies accessible[216] to the citizenry. To ensure this objective is reachable, it is convenient to determine whether the new functionalities of the digital euro can be considered as an improvement over the current state of digital payments in the European Union.

At this point in time, instant settlement of digital payments is available in the European Union, although it is still costly and not accessible to all citizens. As previously mentioned,

[209] Most solutions and functionalities considered in the Proposal are intended for online transactions, especially concerning the prevention of fraud, as it will be addressed in subsection 5.3.8 "*General fraud detection and prevention mechanism – Article 32 Proposal*" below. Only AML and Privacy seem to focus adequately on offline transactions, although this assertion will be qualified in subsection 6.7.2 "*Offline transactions only*" in Chapter 6 of the Thesis.

[210] The measure described in this paragraph is a general prevention measure meant to act ex ante, yet a fraud detection system for offline transactions, equivalent to that included in Article 32 of the Proposal, might be welcome too.

[211] See subsection 3.2.3.2.2 "*Holding limits in Article 16(4)˝* in Chapter 3 of the Thesis.

[212] See Article 16, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[213] See subsection 3.2.3.2.2.1 "*Online vs. Offline limits - Article 16(4) Proposal˝* in Chapter 3 of the Thesis.

[214] This scenario can only be addressed should the digital euro user hold offline digital euro in a given device who has not yet updated its record online, while the user is using a different device for online digital euro payment transactions. No provision avoiding this possibility is included in the Proposal, hence its assessment.

[215] See section 6.7 "*Anti-Money Laundering – Chapter IX – Article 37 Proposal*" in Chapter 6 of the Thesis.

[216] Accessible in terms of design, with functionalities that ensure digital and financial inclusion of those sectors of the population in need, and from an economic perspective, with many of the functionalities being available at minimal cost or directly for free.

SEPA Instant Credit Transfer[217] and, more recently, TARGET Instant Payment Settlement (TIPS),[218] have made available the infrastructure for PSPs to settle digital payments in a matter of seconds within the European Union, in line with the retail payments strategy of the Eurosystem.[219] This has enabled the appearance of private alternatives that ensure instant settlement of transactions based on the available technology, albeit subject to interests that are not necessarily aligned with the protection of the consumers.[220]

The implementation of the digital euro is meant to improve the readiness and affordability of instant payments to digital euro users. While the digital euro settlement infrastructure is set to run on the same technology described in the previous paragraph,[221] the main improvement of its issuance will arrive from the consumer protection perspective: universal access to instant payment is mostly guaranteed, although the use of the digital euro will find its limitations as a store of value and as a means of payment,[222] which comes as a reasonable trade-off for users, in any case.

However, the European Union authorities had considered in the past the implementation of alternative settlement technologies for the issuance of the digital euro,[223] such as distributed ledger technology (DLT).[224] The potential benefits of its use would have been, among others, an improvement on financial transparency, hence improving the monitoring and regulation of markets, as well as an increase in security in transactions, thanks to cryptography.[225] In addition to that, the implementation of mixed models of DLT

[217] See *supra* note 201.

[218] See *supra* note 202.

[219] See *Our retail payments strategy*, European Central Bank – Eurosystem. Retrieved from: https://www.ecb.europa.eu/paym/integration/retail/retail_payments_strategy/html/index.en.html. Last accessed on September 11, 2024.

[220] See *supra* note 203. The business model of those PSPs is usually based on making the service free for payers who are natural persons and charge fees to payees, namely merchants, who accept them as a means of payment. See subsection 3.3.4 "*Charges to merchants and inter-PSP fees*" in Chapter 3 of the Thesis to understand the limitations laid down by the Proposal to these business models when the digital euro is first issued.

[221] Despite not being mentioned anywhere in the Proposal, we must assume this technology will be part of the settlement infrastructure for the digital euro because of the implications on *supra* notes 201, 202, and 220.

[222] See Chapter 3 ("*The digital euro as a store of value and as a means of payment*") of the Thesis.

[223] See, e.g., *The Digital Euro Project: Recent developments - the European Commission and ECB perspectives*, Herbert Smith Freehills. Retrieved from: https://www.herbertsmithfreehills.com/notes/tmt/2023-10/the-digital-euro-project-recent-developments-the-european-commission-and-ecb-perspectiv Last accessed on September 11, 2024.

[224] See subsection 1.2.2.2 "*Conventional or DLT infrastructure*" in Chapter 1 of the Thesis.

[225] See section 4.6 ("*Potential benefits to trade*") in Ward, O., & Rochemont, S. (2019). Understanding central bank digital currencies (CBDC). Institute and Faculty of Actuaries, 13(2), 263-268.

could have enabled the use of a permissioned blockchain,[226] allowing only relevant actors to participate validating transactions and, hence, ensuring control over the settlement infrastructure. Should this alternative technology be considered for the final design of the digital euro, many other functionalities would have been considered, including a revised, and maybe improved, definition of conditional payments.[227] Technological progress would have been explicit and this analysis would have not been necessary.

On the other hand, the main disadvantages of said alternative settlement technologies have sustained the decision on the final design of the digital euro. In particular, the energetic efficiency of DLT settlement infrastructures in addition to their inability to process a massive number of operations have weighted in the final decision.[228] In addition to that, permissioned blockchains raise the question of who should be included, with the threat of enabling an oligopoly, while current cryptography systems might not be resilient as the world assist to the dawn of quantum computing, able to disable such protection systems.[229] Finally, specific issues concerning the settlement of offline transactions have also arisen.[230]

In sum, the final decision on using already available and well-known technologies for the settlement of the digital euro seems to be adequately justified. However, this consideration on settlement of digital transactions enables a new line of debate on whether the digital euro, and CBDCs in general, are required at all.

5.3.6.2.1 Critique – Do we need a digital euro or just better settlement infrastructures? In line with the limitations pointed out for both the classic settlement infras-

[226] See "*Permissioned blockchain*" in the *Glossary*.

[227] See subsection 5.2.4 "*Conditional digital euro transactions vs. Programmable money – Article 24 Proposal*" above.

[228] See section 4.7 ("*Limitations of Blockchain technology*") in Ward, O., & Rochemont, S. (2019). Understanding central bank digital currencies (CBDC). Institute and Faculty of Actuaries, 13(2), 263-268.

[229] See *The Future of Quantum Internet Using Distributed Ledger Technology and Networks*, Medium. Retrieved from: https://medium.com/@kootie73/the-future-of-quantum-internet-using-distributed-ledger-technology-and-networks-99e65f1 Published on June 8, 2024. Last accessed on September 11, 2024. However, this argument flows both ways: quantum computing may render all current cryptography obsolete, yet it could be use to create a new generation of undecipherable cryptography. A resilient payments system should consider its durability and this could be the way in the years to come.

[230] See *E-krona pilot Phase 4*, Sveriges Riksbank. Retrieved from: https://www.riksbank.se/en-gb/press-and-published/notices-and-press-releases/notices/2024/the-e-krona-pilot-phase-4-offline-payments-with-e-krona/. Published on March 20, 2024. Last accessed on September 11, 2024. The Sveriges Riksbank -Sweden's central bank- has acknowledged the issues that may arise concerning the settlement of offline transactions using a DLT settlement infrastructure, namely limitations on the number of consecutive offline transactions that any user can perform and possible duplication of funds threats.

tructure used for the digital euro and other alternatives that benefit from technological advances, such as DLT settlement infrastructures, there is a stream of both academic and technological thought on whether the digital euro, and with it CBDCs, are even necessary. According to the advocates of this line of thought, CBDCs are not required to satisfy the needs of the population, as long as settlement infrastructures are improved to provide users with new capabilities that enable faster and safer digital payments. In other words, it is argued that the extra step of creating a CBDC that uses the already existing settlement infrastructure can be bypassed, focusing all available resources to improving said infrastructure.[231]

Reducing the concept to its bare minimum expression, it could be said that digital central bank money, and hence CBDCs, have existed for decades.[232] The novelty has been brought by the idea of making it available to the public, in the form of retail CBDCs.[233] This has been, however, the target of recent criticism. In particular, Member States whose currency is not the euro Czech Republic[234] and Denmark[235] have manifested their opinion against issuing a CBDC since it clashes with their current retail payment structure and strategy. In line with this rationale, the Bank of Lithuania performed a controlled test issuing the first digital collector coin -LBCOIN-, a CBDC based on a DLT settlement infrastructure that was discontinued because of its lack of a proper purpose for the population.[236] Outside of the European Union, the digital dollar project is currently in a prolonged pause,[237] despite a recent call from the Board of Governors of the Federal Reserve System to continue the analysis of its issuance.[238]

[231] DANMARKS NATIONALBANK (2017). Central bank digital currency in Denmark?

[232] See slide 4 on *Tokenisation of financial instruments and central bank money settlement – Presentation by Piero Cipollone, Member of the Executive Board of the ECB*, EUROPEAN CENTRAL BANK – EUROSYSTEM. Retrieved from: https://www.ecb.europa.eu/press/key/date/2024/html/ecb.sp240509~0a45ca25ac.en.pdf?20f1c4a37f4d2d7b7659a811355be72f. Published on May 9, 2024. Last accessed on September 10, 2024.

[233] See subsection 1.2.2.4 "*Wholesale or retail*" in Chapter 1 of the Thesis.

[234] Vodrážka, M., Bízek, T., & Vojta, M. (2022). Are there relevant reasons to introduce a retail CBDC in the Czech Republic from the perspective of the payment system. *BIS Papers*, 65.

[235] See *supra* note 231.

[236] See *Experience gained through the LBCOIN project used to study the feasibility of a digital euro*, LIETUVOS BANKAS – EUROSISTEMA. Retrieved from: https://www.lb.lt/en/news/the-experience-gained-through-lbcoin-project-used-to-study-the-feasibility-of-a-digital Published on July 27, 2021. Last accessed on September 11, 2024.

[237] See *Is the digital dollar dead?*, MIT TECHNOLOGY REVIEW. Retrieved from: https://www.technologyreview.com/2023/07/21/1076645/is-the-digital-dollar-dead/. Published on July 21, 2024. Last accessed on September 11, 2024.

[238] See *Central Bank Digital Currency (CBDC)*, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM. Retrieved from: https://www.federalreserve.gov/central-bank-digital-currency.htm. Published on August 4, 2024. Last accessed on September 11, 2024.

However, despite this criticism, other countries, including other Member States whose currency is not the euro such as Sweden and Hungary,[239] are still making progress in their own CBDC projects, evidencing the interest of monetary authorities on its issuance.

5.3.7 Switching of digital euro payment accounts – Article 31 Proposal

Article 31 of the Proposal outlines the process for switching digital euro payment accounts between PSPs.[240] Point 1 requires PSPs to allow digital euro users to switch their accounts to another provider upon request, while retaining the same account identifiers.[241] In exceptional cases where a PSP is unable to provide services for an extended period or has lost the relevant account data, the European Central Bank and national central banks may authorize the transfer of the user's digital euro payment account to a new PSP designated by the user, according to point 2 of the Article.[242]

The Proposal had already stressed out the importance of the account identifier[243] being unalterable, no matter which PSP is being used to access the digital euro services in Recital (67)[244] and Article 2, point 26, of the Proposal.[245] The mandate expressed in Article 31, point 1, acts as a confirmation for the digital euro user's right to preserve the account identifier associated to their digital euro payment account when switching[246] PSPs.[247] This decision contributes to improve the quality of use of the service in two

[239] See *Central Bank of Hungary launches first live CBDC project with Perfinal*, IBS Intelligence. Retrieved from: https://ibsintelligence.com/ibsi-news/central-bank-of-hungary-launches-first-live-cbdc-project-with-perfinal/. Published on August 18, 2023. Last accessed on September 11, 2024. It must be said, however, that the Hungarian CBDC project consist of a pilot project focused strictly on young sectors of the population.

[240] See Article 31 ("*Switching of digital euro payment transactions*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[241] See Article 31, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[242] See Article 31, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[243] See point 4.2 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). "*Account identifier*" and "*digital euro payment account number*" are not defined in Article 2 of the Proposal, while "*user alias*" and "*user identifier*" are. The European Central Bank recommends avoiding the use of "account identifier" and its substitution with "*digital euro payment account number*" or "*user alias*" where applicable.

[244] See Recital (67) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[245] See Article 2 ("*Definitions*"), point 26, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[246] See "*Switching*" in the *Glossary*.

[247] See *supra* note 241.

different ways. First, it would be wasteful to neglect digital euro users this option, as plenty of new account identifiers would be required daily. Second, since the digital euro settlement infrastructure is common to all users and accounts, using an unalterable standard simplifies the naming convention, as opposed to other alternatives as the IBAN standard.[248] This decision can be seen as an improvement in terms of technical efficiency and users will surely prefer this approach.[249]

For its part, Article 31, point 2, enables the European Central Bank and national central banks to authorise an "*emergency switching*"[250] of digital euro payment accounts in exceptional circumstances where a PSP cannot provide digital euro payment services for a prolonged period of time or has lost the digital euro payment account-related data concerned.[251] Despite the existence of contingency or continuity plans in the industry,[252] a major disruption of digital euro services may be linked to the impossibility of a given PSP to provide digital euro services to its users in the terms here described. Consequently, the switching may be authorised, with the European Central Bank and the relevant national central banks involved providing the required data to the new PSP. Thus, ensuring the switching without having to rely on the unavailable PSP.

While the usefulness of this provision is obvious, the content of the Article does not address relevant topics that are inherently related. For instance, there is no explicit reference to which data will be available in the European Central Bank's records and whether its processing is already included in the content of Article 35 of the Proposal.[253]

[248] While IBAN (International Bank Account Number) is a great and internationally agreed upon system that allows for identification of bank accounts across national borders, it entails certain limitations when compared to the alternative included in the Proposal. The IBAN standard comprises explicit reference to the commercial bank that holds the account. Since the digital euro is centralised in the digital euro settlement infrastructure maintained by the European Central Bank, that kind of information is not relevant anymore and its deletion allows for this unalterable naming convention.

[249] It must be pointed out that, to this day, nothing on the naming convention has been said to the public. However, technical documentation provided to implementation partners references this idea, yet it cannot be cited here.

[250] See Article 35, point 8, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. The European legislator uses this name to describe the hard switching in Article 31, point 2, of the Proposal.

[251] See *supra* note 242.

[252] A common practice in digital industries, such as payment services, is providing contingency or continuity plans to ensure that the services can still be offered to the customers even in the event of a catastrophe, such as the ones subtly described in Article 31. These plans usually involve the use of backups of the existing information, guaranteeing minimal or no loss of data. See, e.g., *Business Continuity Plan Disclosure*, Santander Corporate & Investment Banking, retrieved from: https://www.santandercib.com/sancap/business-continuity-plan-disclosure. Last accessed on August 30, 2024.

[253] See Article 35 ("*Processing of personal data by the European Central Bank and the national central banks*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on

[254] This highlights the growing tension that arise in this provision between the usefulness of an "*emergency switching*" and digital euro users' privacy. Additionally, nothing is said concerning offline digital euro records not yet updated, which may cause funds to be lost if the associated data is not processed adequately. The European Central Bank will not be able to have access to that information,[255] hence the need for an explicit solution.

5.3.8 General fraud detection and prevention mechanism – Article 32 Proposal

Article 32 of the Proposal outlines the framework for a general fraud detection and prevention mechanism for online digital euro transactions.[256] According to point 1, the European Central Bank may establish this mechanism to support PSPs in fulfilling their fraud detection and prevention duties under Directive 2015/2366 (PSD2).[257] Article 32, point 2, establishes that the European Central Bank must consult the European Data Protection Supervisor before finalising the operational details of the mechanism.[258] This mechanism will assess fraud risk in real-time before transactions enter the digital euro settlement infrastructure and assist PSPs in identifying fraudulent transactions post-settlement, in accordance with point 3 of the Article.[259] Finally, point 4 determines that PSPs shall provide with the information referred to in Annex V,[260] while implementing appropriate technical and organisational measures to minimise fraud in payments.[261]

Point 1 to Article 32 states the possibility of the European Central Bank establishing a

the establishment of the digital euro. COM/2023/369 final.

[254] See section 6.5 "*Processing by the ECB and national central banks – Article 35 Proposal*" in Chapter 6 of the Thesis.

[255] *Id*. Offline digital euro is akin to withdrawing cash from an ATM and its transactions are settled in the storage of the authorised device used. The records are only updated to reflect the offline digital euro holdings in what refers to holding limits pursuant to Article 16 of the Proposal.

[256] See Article 32 ("*General fraud detection and prevention mechanism*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[257] See Article 32, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[258] See Article 32, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[259] See Article 32, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[260] Annex V ("*Personal data processed by providers of support services*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[261] See Article 32, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

general fraud detection and prevention mechanism for online digital euro transactions, which, conditional to its implementation, may be operated directly by the monetary authority or by providers of support services.[262] [263] The once again explicit reference to Directive 2015/2366 (PSD2) is based on the applicability of said Directive to digital euro payment transactions.[264] Additionally, the position of the European Central Bank is similar as described previously in Article 27, point 3, of the Proposal.[265] Thus, despite the lack of an explicit reference, the European Central Bank should not be considered as a party in any of the relationships that arise with customers using the prospective general fraud detection and prevention mechanism, although it could be argued that it will be responsible for any malfunctioning that digital euro users may experience when accessing it.[266]

The most relevant inclusion in this provision concerns the fact that the general fraud detection and prevention mechanism will only be available for online digital euro payment transactions. The absence of connectivity during offline digital euro payment transactions could be the rationale for this rejection, although those transactions could still benefit from the implementation of the ex post measures this Article establishes, as it would be addressed later in this section.[267]

For its part, Article 32, point 2, of the Proposal[268] imposes the obligation on the European Central Bank to consult the European Data Protection Supervisor, as the relevant authority on the matter, prior to developing the details on the operational elements of the fraud detection and prevention mechanism, as the processing of personal data would be required.[269]

[262] See *supra* note 257.
[263] See subsection 5.3.3 "*Dispute mechanism – Article 27 Proposal*" above.
[264] But see *supra* note 139.
[265] See *supra* note 138.
[266] See subsection 5.3.3 "*Dispute mechanism – Article 27 Proposal*" above.
[267] See subsection 5.3.6.2 "*Improvements over the existing settlement technology*" below.
[268] See *supra* note 258.
[269] See Article 5, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

5.3.8.1 Fraud detection in the context of PSD2

The implementation of PSD2[270] imposed in PSPs operating in the European Union the obligation to comply with a more demanding legal framework concerning fraud detection in digital payments. In this context, PSD2 updated the legal consequences PSPs may be facing when unauthorised payments have been performed against the will of consumers whenever an adequate level of diligence in the use of payment instruments can be proven.[271] In addition to that, the Directive also introduced new provisions impacting authentication, data protection, and the handling of fraud in digital transactions, elevating the security standards to a new high.[272]

Consequently, PSPs were led to implement anti-fraud systems aimed at minimising unauthorised transactions,[273] in line with the contents of Chapter 5 of PSD2.[274] In particular, the management of operational and security risks,[275] as well as incident reporting of major incidents on the topic of fraudulent authorisation of digital payments[276] were improved by tight controls stemming from European Banking Association (EBA) and its supervision of actions taken by PSPs in the European Union. The guidelines issued by the EBA imposed specific requirements to PSPs on which data on fraudulent payments shall be reported to the relevant authorities.[277] While this effort has contributed to reduce

[270] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Service Directive or PSD2.)

[271] See *supra* note 258.

[272] See Chapter 5 ("*Operational and security risks and authentication*") of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Service Directive or PSD2.)

[273] After a new and more demanding standard for fraud mitigation was implemented with PSD2, PSPs were required to refund users for unauthorised payment transactions in cases where users were found to be diligent in the custody of their payment instruments. An obvious incentive to improve the anti-fraud measures for digital payments appeared as a consequence, imposing higher risks to PSPs, as they are in a better position to face them, in line with the intentions of the European legislator.

[274] See *supra* note 272.

[275] See Article 95 ("*Management of operational and security risks*") of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Service Directive or PSD2.)

[276] See Article 96 ("*Incident reporting*") of Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Second Payment Service Directive or PSD2.)

[277] See section 4 ("*Guidelines*") of *Final Report – Guidelines on fraud reporting under the Payment Services Directive 2 (PSD2)*, European Banking Authority. Retrieved from: https://www.eba.europa.eu/guidelines-fraud-reporting-under-psd2. Published on January 22, 2020. Last accessed on

the impact of fraud in digital payments,[278] the legal framework can still benefit from new technological implementations, hence the appearance of a proposal for a new payment services directive, known as the Third Payment Services Directive or PSD3.[279] [280]

5.3.8.2 Improvements included in article 32(3) Proposal

Article 32, point 3, of the Proposal[281] establishes the main functionalities that the general fraud detection and prevention mechanism introduced in point 1 of the same article shall include. In particular, two remedies are included, which are addressed in the next paragraphs.

First, letter a) to the aforementioned provision determines that the general fraud detection and prevention mechanism shall assess the exposure to fraud risk of online digital euro transactions in real-time at the exclusive use of payment service providers before the transaction is introduced into the digital euro settlement infrastructure.[282] As described, this measure involves ex ante verifications of the level of fraud risk involved in the digital euro transaction. Since online digital euro payment transactions become final once they have been registered in the digital euro settlement infrastructure, this measure is needed to prevent fraudulent transactions from being irremovable.[283] While this measure is listed as a requisite for the general fraud detection and prevention mechanism to be implemented by the European Central Bank, it is not a new feature. Under PSD2, as addressed in the previous subsection,[284] PSPs ensure that suspicious transactions cannot be performed. However, the implementation of the aforementioned system acts as an opportunity to improve the currently anti-fraud system, which may become unreasonable at times despite the existence of multi-factor authentication (MFA)

September 14, 2024.

[278] See section 4 (“*The role of strong customer authentication (SCA)*”) of 2024 *Report on payment fraud*, European Banking Authority. Retrieved from: https://www.eba.europa.eu/publications-and-media/press-releases/eba-and-ecb-release-joint-report-payment-fraud. Published on August 1, 2024. Last accessed on September 14, 2024.

[279] Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on payment services and electronic money services in the Internal Market amending Directive 98/26/EC and repealing Directives 2015/2366/EU and 2009/110/EC. COM/2023/366 final.

[280] The upcoming PSD3 is addressed in Articles 5 (“*Applicable law*”) and 6 (“*Competent authorities*”) of the Proposal.

[281] See *supra* note 259.

[282] See Article 32, point 3, letter a), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[283] Without prejudice of the content of letter b) in Article 32, point 3, addressed below.

[284] See subsection 5.3.8.1 "*Fraud detection in the context of PSD2*" above.

with biometric measures pursuant to PSD2.[285]

Second, letter b) to Article 32, point 3, of the Proposal determines that the general fraud detection and prevention mechanism shall support payment service providers in detecting fraudulent transactions in online digital euro payment transactions that have been settled.[286] As described, this measure involves ex post verifications of the level of fraud risk involved in the digital euro transaction. While online digital euro payment transactions become final once registered in the digital euro settlement infrastructure, the European legislator enables the possibility of reverting those payment transactions when fraud is present.[287] The implementation of this measure as a solution of last resort is needed for those transactions that could not be identified as fraudulent in advance. However, criticism may arise concerning this measure, as it could have been implemented for offline digital euro payment transactions too. Since, in this case, control of fraudulent behaviour is analysed ex post, offline digital euro payment transactions could have been subject to this analysis once the records are updated as the digital euro user is online again. Considering how the European legislator is focused on money laundering and financing of the terrorism as an inherent problem for offline digital euro payment transactions, it is hard to justify that fraud prevention in the fashion described in this particular provision cannot be implemented for those transactions.[288]

[285] See Raya-Quero, D. (2020). La diligencia de los usuarios y el papel de la biometría en la Directiva (UE) 2015/2366. Diario La Ley, (9742), 1. The current legal framework set up by PSD2 forces PSPs to reimburse customers for unauthorised payments as long as they have act diligently. This incentivises PSPs to adopt anti-fraud systems that are harsher than ideally needed, to avoid having to reimburse users. This leads to consumers unable to perform digital transactions because they are not aligned with standard and usual transactions performed in the past. For instance, users are likely to be prevented from buying a plane ticket valued on €500 when the common usage of their selected means of payment, namely debit cards because of the instant settlement of the transaction, is associated to low value transactions. Despite multi-factor authentication measures benefiting from the inclusion of biometric sensors in current means of payment, this behaviour cannot be prevented. This is why the situation may be improved thanks to the involvement of the European Central Bank, as unusual transactions are sometimes required and does not require extreme prevention.

[286] See Article 32, point 3, letter b), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[287] As long as the requisites of diligent and authorised use of the means of payment, pursuant to the contents of Directive 2015/2366 (PSD2) are met.

[288] See subsection 6.7.2 "*Offline transactions only*" in Chapter 6 of the Thesis.

5.3.8.3 Annex V Requirements – Article 32(4) Proposal

Finally, Article 32, point 4, of the Proposal[289] establishes that PSPs shall provide the general fraud detection and prevention mechanism with information referred to in Annex V.[290] In addition to that, PSPs are required to implement appropriate technical and organisational measures including state-of-the-art security and privacy-preserving measures to ensure that the support service shall not be able to directly identify the digital euro users on the basis of the information provided to the fraud detection and prevention mechanism, in line with the requirements of Chapter VIII of the Proposal.[291]

According to Annex V of the Proposal,[292] information on the transaction session, including the unique digital euro account identifier[293] and the transaction amount, as well as device's the internet protocol address-range, commonly known as IP address.[294] The inclusion of the IP address is a good prevention measure, as it will be easier to determine whether it was the user who initiated the transaction, based in its location, among other considerations.[295]

5.3.9 Fair, reasonable and non-discriminatory access to mobile devices – Article 33 Proposal

Article 33 of the Proposal seeks to ensure fair, reasonable, and non-discriminatory access to mobile devices for processing digital euro transactions.[296] Point 1 requires that original equipment manufacturers (OEMs) of mobile devices and providers of electronic communication services to allow providers of front-end services and European Digital Identity Wallets[297] effective interoperability with the necessary hardware and software features

[289] See *supra* note 261.
[290] The Proposal refers to "*Annex V*" as "*Annex 5*" mistakenly here.
[291] The analysis of Chapter VIII ("*Privacy and data protection*") is addressed later in the Thesis. In particular, see subsection 6.3.1.2 "*Controller of the data and state-of-the-art measures*" in Chapter 6 of the Thesis.
[292] See *supra* note 261.
[293] See "*Digital euro payment account number*" in the *Glossary*. The lack of homogeneity in the terms used in the Proposal may cause confusion in the reader, being these ("*unique digital euro account identifier*" and "*digital euro payment account number*") two categories that reference the same concept.
[294] See "*Internet protocol address-range (IP Address)*" in the *Glossary*.
[295] See subsection 6.6.1 "*Relevant differences*" in Chapter 6 of the Thesis for an in-depth analysis of the implications associated to the availability on IP address data.
[296] See Article 33 ("*Fair, reasonable and non-discriminatory access to mobile devices*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[297] See *supra* notes 104 and 105.

to store and transfer data for online or offline digital euro transactions.[298] According to point 2, OEMs and service providers are only allowed to implement strictly necessary and proportionate measures to protect the integrity of their hardware and software, as long as these measures are justified.[299] Furthermore, point 3 establishes that OEMs and service providers must publish general conditions for interoperability and access, which must include an EU-based alternative dispute resolution mechanism, while preserving the right to seek legal redress in accordance with Union and national law.[300]

The inherently technical approach of Article 33 recommends considering relevant definitions before analysing its content. While "*mobile device*" is properly defined in the Proposal,[301] [302] "*original equipment manufacturers*"[303] and "*providers of electronic communication services*"[304] are not, despite the impact on the attribution of obligations to those who are included in any of the two. In fact, these two categories do not seem to be explicitly defined in any source of law in the European Union,[305] [306] hampering the categorisation of the involved actors.

Considering the above, OEMs and providers of electronic communication services shall allow providers of front-end services and providers of European Digital Identity Wallets effective interoperability to the hardware features and software features necessary for storing and transferring data to process online or offline digital euro transactions, on fair, reasonable and non-discriminatory terms.[307] Accordingly, OEMs and providers of electronic communication services must ensure compatibility with the standards designed for digital euro payment services, which may impose obligations to update already existing systems, in addition to require designing future innovations with these requirements

[298] See Article 33, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[299] See Article 33, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[300] See Article 33, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[301] See Article 2, point 31, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[302] See "*Mobile device*" in the *Glossary*.
[303] See "*Original equipment manufacturer (OEM)*" in the *Glossary*.
[304] See "*Providers of electronic communication services*" in the *Glossary*.
[305] "*Original equipment manufacturer*" is actually used in other sources of primary law in the European Union, however in a different context. It would be recommendable to include a definition of the category in the specific context of this Proposal in order to understand which manufacturers may belong in it.
[306] For its part, "*providers of electronic communication services*" requires the abstraction of reviewing Article 2, point 1, of Directive (EU) 2018/1972 to obtain a description of the category. It would also be recommendable to include a definition in the Proposal.
[307] See *supra* note 298.

in minds. This is, however, without prejudice of Article 6 of the Digital Markets Act,[308] which enables gatekeepers[309] to take strictly necessary and proportionate measures to ensure that interoperability does not compromise the integrity of the system, as long as those measures are duly justified by the gatekeeper, which is precisely the content of the next provision.

Thus, Article 33, point 2, of the Proposal reiterate that OEMs and providers of electronic communication services shall not be prevented from taking strictly necessary and proportionate measures to ensure that interoperability does not compromise the integrity of the hardware and software features concerned by the interoperability obligation provided that such measures are duly justified.[310] The mandate established in the Digital Markets Act has raised concerns on relevant OEMs concerning the issuance of the digital euro, as restrictions over near-field communication (NFC) technology have been required for security reasons, although the European Central Bank has expressed that the requirement to provide adequate justification goes beyond generic concerns on the topic.[311]

Finally, Article 33, point 3, of the Proposal enables a process to align interests between the European Union authorities and OEMs and providers of electronic communication services for the purposes of this provision.[312] In this manner, for the purpose of applying fair, reasonable and non-discriminatory terms pursuant to the content of this provision, OEMs and providers of electronic communication services shall publish general conditions of effective interoperability and access, including a European Union-based alternative dispute settlement mechanism.[313] This approach incentives improvement while ensures reasonableness for all parties: OEMs and providers of electronic communication services are in the right position to determine what terms are fair, yet the European Union authorities may dispute said claims should they be excessively beneficial to them.

[308] See Article 6, point 7, of Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act.)

[309] See "*Gatekeeper*" in the *Glossary*.

[310] See *supra* note 299.

[311] See *Feedback on commitments offered by Apple over access restrictions to near-field communication technology*, European Central Bank – Eurosystem. Retrieved from: https://www.ecb.europa.eu/pub/pdf/other/ecb.letter240419_Breton~fe4828c691.en.pdf?0330ce486b54153e4bbee0166196dd55. Published on April 19, 2024. Last accessed on September 15, 2024.

[312] See *supra* note 300.

[313] This is without prejudice to the right to seek redress before judicial authorities in accordance with Union and national law, in accordance with Article 33, point 3, of the Proposal.

5.3.9.1 Critique – The technological progress paradox

The efforts of the European legislator into ensuring fair, reasonable, and non-discriminatory access to mobile devices as presented in Article 33 of the Proposal envisions the current efforts of the Union authorities towards an adequately interoperable digital payments landscape. In line with the objectives of the Digital Markets Act,[314] the digital euro is aimed at providing universal access to a public digital means of payment for the citizens in the European Union. However, several actions in this direction are subject to debate from a legal perspective.

First, in search of interoperability and adequate access for the providers of front-end services to the original manufacturers of mobile devices (OEMs) as described in the previous sub-section, the European Union is demanding access to certain capabilities of said mobile devices, arguably on the edge of the legal framework. These requirements have been recently criticised by relevant OEMs,[315] albeit finally complying with the requirements at the risk of severe consequences.[316] This kind of behaviour, despite being founded in reasons of digital inclusion, may be hampering the free competition of OEMs in the European Union, minimising their interest in our market. Should every OEM give up their technical advantages in technology and safety to be compliant with the regulatory framework in the European Union, incentives to bring newer and better products may disappear.[317]

Second, leaving behind the conflicts that may arise from a hardware perspective,

[314] Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act.)

[315] See *supra* note 311. Apple made initial commitments to ensure access to near-field communication (NFC) technology in its mobile devices, yet the European Union considered they were insufficient for offline digital euro payment transactions. Before these requirements, Apple had been reluctant to enable third-parties to access NFC technology in its devices because of great risks of security breaches.

[316] See *Apple avoids massive EU fines by opening NFC technology to third-party providers*, Fintech Global. Available at: https://fintech.global/2024/07/11/apple-avoids-massive-eu-fines-by-opening-nfc-technology-to-third-party-providers/. Published on July 11, 2024. Last accessed on September 23, 2024. Finally, Apple gave in and decided to open its access to NFC technology despite calls for reasonableness, which were unattended by the European Commission.

[317] See, e.g., *Apple Intelligence won't launch in EU in 2024 due to antitrust regulation, company says*, CNBC. Available at: https://www.cnbc.com/2024/06/21/apple-ai-europe-dma-macos.html. Published on June 21, 2024. Last accessed on September 24, 2024. Apple has decided to postpone the implementation of its AI model, as well as other new software functionalities, until the impositions addressed by the Digital Markets Act to the company are duly addressed. This action prevents citizens in the European Union from using said capabilities despite having access to equivalent hardware to that of consumers in other markets, such as the USA, hence hampering their experience.

software updates are also subject to criticism. While operative systems are usually updated to include security updates preventing newly discovered vulnerabilities, older devices are not always updated by OEMs.[318] This enables two problems that cannot be solved at the same time: either they are not updated, yet the digital euro ensures compatibility with them despite the security vulnerabilities, which may impact the digital euro software and enable unauthorised third party access to the funds; or the digital euro requires those updates to be accessible, rendering those mobile devices who are not updated useless, forcing the consumers to acquire new ones to access the digital version of the single currency.

Security and accessibility may become antagonists should the digital euro rely exclusively in front-end services that are accessed using a mobile device application.[319] The dichotomy introduced in the previous paragraph presents even worse risks for consumers with fewer financial resources, as cheaper mobile devices are more prone to not being properly updated,[320] as well as having poorer security systems to prevent unauthorised access.[321] Consequently, digital inclusion becomes even harder, should the European Union authorities demand exigent control of software security for the mobile devices.

The debate on digital inclusion can be stretched even more, to include the excessive reliance of the European Union authorities in OEMs to provide accessible, yet safe, mobile devices for the population to access the digital euro services. However, mobile devices are arguably not the best option in terms of usability for certain segments of the population,

[318] See, e.g., *Is Android fragmentation still a problem for IT teams?*, TechTarget. Available at: https://www.techtarget.com/searchmobilecomputing/tip/Is-Android-fragmentation-still-a-problem-for-IT-teams. Published on October 6, 2023. Last accessed on September 23, 2024. Android is the most popular mobile device operative system (OS) worldwide, with over 70% of the market. However, some OEMs do not implement security updates, or, sometimes, no OS updates at all, exposing mobile devices to severe vulnerabilities.

[319] See, e.g., Xu, H., Yao, M., Zhang, R., Dawoud, M. M., Park, J., & Saltaformaggio, B. (2024). {DVa}: Extracting Victims and Abuse Vectors from Android Accessibility Malware. In *33rd USENIX Security Symposium (USENIX Security 24)* (pp. 701-718). Ironically, accessibility functions can be exploited to abuse consumers, as shown in the referenced paper. Software updates are required to prevent this kind of backdoor access to the system, yet it impose additional difficulties to comply with the objective of digital inclusion.

[320] See, e.g., *Google explains the Pixel's 8 seven years of software updates*, androidcentral. Available at: https://www.androidcentral.com/apps-software/google-explains-pixel-8-update-promise. Published on March 29, 2024. Last accessed on September 23, 2024. While relevant OEMs, like Google or Apple, ensures software updates for years, other manufacturers, especially those who provide entry-level options, do not make such promises to customers acquiring their devices.

[321] See *Many Android Phones Can Be Unlocked by Photos*, Forbes Cybersecurity. Available at: https://www.forbes.com/sites/emmawoollacott/2023/05/19/many-android-phones-can-be-unlocked-with-a-photo/. Published on May 19, 2023. Last accessed on September 23, 2024.

in particular those segments explicitly pointed out in Article 22 of the Proposal.[322] Despite their versatility, mobile phones are not the preferred option for those segments of the population, namely older persons who are not tech-savvy.[323] Consequently, the lack of alternatives in the Proposal to ensure access for those in need of digital assistant is shocking. The European legislator should consider the adoption of an alternative approach that adopts a format more adequate to the needs of this growing segment of the population. For instance, hybrid banknotes[324] or cards with biometric sensors and a small screen that may provide basic information for the user[325] are adequate alternatives that may be explored to complement the current approach, solely based on mobile device applications.

As a corollary, the difficulties that the European legislator is facing cannot be addressed in a single way, as the use of new technologies like those described in the Proposal for the digital euro enable scenarios that may cause conflict. In any case, should the European Union authorities wish to be consistent with their own mandates in the Proposal, a better action plan should be put forward. Otherwise, the good intentions that are currently proposed could come to nothing.

[322] See *supra* notes 5, 6, 15, 16 and 17.

[323] See, e.g., *¿Cuándo se apagará el 2G y el 5G en España?*, ADSLZone. Available at: https://www.adslzone.net/noticias/operadores/apagado-2g-3g-planes-2022/. Published on July 2, 2024. Last accessed on October 28, 2024. The radiofrequency spectrum is limited so, to make room for 5G technologies, older standards are being shut down. 3G will not be accessible in 2025, however plenty of functional mobile devices currently in use by older segments of the population will not be usable, forcing those consumers to acquire newer devices including characteristics that are not essential for them.

[324] See *Hybrid Banknotes Can Bridge Cash and Crypto*, CoinDesk. Available at: https://www.coindesk.com/business/2021/05/12/hybrid-banknotes-can-bridge-cash-and-crypto/. Published on May 12, 2021. Last accessed on September 23, 2024. Hybrid banknotes, when properly designed, may enable the use of a known means of payment, physical banknotes, for digital payment transactions, reducing the learning curve of segments of the population less accustomed to the use of newer technologies.

[325] See *MASTERCARD® BIOMETRIC CARD[200E?] - Driving cardholder security and convenience*, MasterCard. Available at: https://www.mastercard.us/en-us/business/overview/safety-and-security/authentication-services/biometrics/biometrics-card.html. Last accessed on September 23, 2024. Combining the idea of a card that relies on biometrics and including essential and easily understandable feedback for the digital euro user on a small screen, accessibility could be ensured for nearly all segments of the population.

Chapter 6

Privacy, data protection and AML/CFT requirements

6.1 Introduction to Chapters VIII and IX of the Proposal

Chapters VIII ("*Privacy and data protection*")[1] and IX ("*Anti-money laundering*")[2] are the final sections of the Proposal[3] that regulate practical aspects of the digital euro. While the first addresses personal data and authorised processing by relevant operators in Articles 34 to 36, with references to Annexes III to V, the latter condenses all provisions concerning anti-money laundering and combating the financing of terrorism in the isolated Article 37.[4]

The placement of these two chapters in the Proposal is not trivial, as the European legislator is fostering its intertwined analysis: the most obvious restriction to privacy measures, as implemented to protect digital euro users, can be found in the limitations that are required to ensure compliance with the anti-money laundering and combating the financing of terrorism framework, which restrict anonymity in pursuit of balance between digital euro users' preferences and rejection of undesired behaviour concerning payment transactions. Despite this adequate intention, the content of both chapters is not exempt

[1] See Chapter VIII ("*Privacy and data protection*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[2] Chapter IX ("*Anti-money laundering*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[3] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[4] This is without prejudice of the observations presented in subsection 6.7.1 "*References to AML/CFT in Article 14(5) and 19(3) Proposal*" below.

of criticism: privacy measures for online digital euro payment transactions only improve the current framework set in the second Payment Services Directive (PSD2)[5] marginally,[6] the language in Chapter IX invites to believe that anti-money laundering measures only apply to offline digital euro payment transactions,[7] and the chosen anonymity rules are not optimal for the relevant authorities nor the users.[8]

The structure of this chapter is as follows: first, the relationship between privacy and digital payments, usually opposites, is explored. Second, an introduction to Chapter VIII of the Proposal is provided, focusing on the common considerations for Articles 34, 35, and 36 of the Proposal. Third, each of the aforementioned provisions are analysed separately, focusing on the data that may be processed by PSPs, the European Central Bank, and the national central banks where needed, and the providers of support services when dealing with digital euro payment transactions. Finally, the content of Chapter IX of the Proposal is analysed, focusing on the AML/CFT measures to be implemented for offline digital euro payment transactions, as well as the rationale for, apparently, excluding online digital euro payment transactions from its regulation.

6.2 Privacy and digital payments

At first sight, digital payments are not compatible with the concept of privacy: whenever a digital payment is made, the identity of both payer and payee is known by each party,[9] the PSP, or PSPs, involved in the transaction and other intermediaries such as card schemes. However, ever since the rise of crypto-assets during the past decade, alternative and pseudo-anonymous means of payment have been available for the population, demonstrating that privacy may be strengthened in digital payments and that users value it. Consequently, regulators around the globe have had to deal with the existing tension between privacy and the need for control of digital transactions. The regulatory response

[5] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (Payment Services Directive 2 or PSD2.)

[6] See subsection 6.4.2 "*Data processed in online and in offline transactions*" below.

[7] See subsection 6.7.1.1 "*Critique – AML should have been addressed altogether*" below.

[8] See subsection 6.7.3 "*Offline transactions and their equivalence to an ATM withdrawal*" below.

[9] It could be argued, however, that the current digital payments landscape has not ensured a proper identification of each party, which may lead to fraud. Under PSD2, a set of identifiers is provided, yet it may induce the opposing party to be led into a scam. What PSD2 ensures is that the identity of both parties can be ascertained if needed, even if it something that must be done ex post in court.

may have diminished the attractiveness of certain digital means of payment[10] but users are still demanding adequate solutions that satisfy their needs in terms of privacy. Bearing this in mind, the European legislator has offered a design for the digital euro that aims at processing minimal personal data in online transactions[11] and is equivalent to an ATM withdrawal for the offline manifestation of the digital euro.[12] Despite these efforts, it can be argued that the Proposal still has room for improvement in terms of privacy as alternative measures could help satisfy all parties' interests.[13]

The aforementioned existing tension between privacy and digital payments can be traced down to a technological aspect: transactions that are recorded in a database cannot be, by definition, anonymous. Contrary to cash transactions, in which there are virtually no records of it,[14] digital payments are designed to store all relevant information that is required to ensure the transaction can be performed.[15] Consequently, that stored data clashes with the objective of privacy and it can only be anonymised or pseudo-anonymised.[16] [17]

While it could be argued whether users value their privacy as much as they state,[18] it cannot be denied that a large proportion of digital payment users are concerned about privacy in transactions.[19] Accordingly, there has been an unprecedented development of

[10] See section 1.1 "*Current legal context on digital payments*" in Chapter 1 of the Thesis.

[11] See subsection 6.3.1.4 "*Minimum amount of data to be processed*" below.

[12] See subsection 6.7.3 "*Offline transactions and their equivalence to an ATM withdrawal*" below.

[13] See subsection 6.7.3.2 "*Alternative approach to anonymisation*" below.

[14] There could be records of a payment transaction using cash, like a bill or a receipt. However, despite those being required for other reasons, such as VAT invoicing, some information is missing, most likely the identity of the party using cash for the transaction and the origin of said funds.

[15] Even in the absence of a regulatory framework like the one laid down in the Second Payment Services Directive (PSD2), a database is used to structure and authorise digital payments and a minimal set of data identifying each party and the origin of funds is stored.

[16] See *What are the Differences Between Anonymisation and Pseudonymisation*, Privacy Company. Retrieved from: https://www.privacycompany.eu/blog/what-are-the-differences-between-anonymisation-and-pseudonymisation. Last accessed on September 4, 2024. Pseudonymisation is the process of replacing identifying information using an encryption key, which can be linked back to the original person with extra information, whereas anonymisation is the irreversible process of rendering personal data non-personal, and not subject to the GDPR.

[17] Anonymised data is still recorded. Consequently, an adequate analysis of anonymised payment transaction data can still allow for identification of individuals.

[18] See Jabbar, A., Geebren, A., Hussain, Z., Dani, S., & Ul-Durar, S. (2023). Investigating individual privacy within CBDC: A privacy calculus perspective. *Research in International Business and Finance*, *64*, 101826. Users may be willing to give up their privacy if the incentives to do so are good enough. This paper's model states that users may claim to be worried about privacy in digital payments, yet their actions show the opposite. Should the theory developed in this paper apply, users will ask for better privacy measures for the digital euro, but they will not value them as much. Consequently, basing the strategy of implementation for the digital euro in "*better privacy*" would end up being ineffective.

[19] See *Study on New Digital Payment Methods*, European Central Bank – Eurosystem. Avail-

digital means of payment focused on privacy in the past decade, especially after surge in digital transactions that arise as a consequence of the Covid-19 pandemic in 2020.[20] In particular, the number of crypto-assets worldwide has nearly multiplied by five,[21] with even higher increase in market capitalisation during this period,[22] evidencing the interest of users in new digital means of payment. Despite this fact, the regulatory response that has come at a different pace around the globe.[23]

In the context of privacy for digital payment transactions, not all crypto-assets are relevant. Stablecoins[24], as targeted by monetary authorities,[25] are considered the main threat to monetary sovereignty because of their aspiration to become a stable crypto-asset that can be used as a digital means of payment providing a higher standard of privacy when compared to conventional alternatives being provided by commercial banks. However, the recent fiascos of Project Libra/Diem[26] [27] and Terra-Luna[28] [29] [30] in 2022 have influenced the population into curbing their expectations for stablecoins. In any case, the desire for an adequate means of payment that provides sufficient privacy measures has not disappear, evidencing the interest and opportunity to explore alternatives. This is

able at: https://www.ecb.europa.eu/euro/digital_euro/timeline/profuse/shared/pdf/ecb.dedocs220330_report.en.pdf. Published in March 2022. Last accessed on September 20, 2024.

[20] *Id*.

[21] *Number of cryptocurrencies*(sic) *worldwide from 2013 to August 2024*, Statista. Retrieved from: https://www.statista.com/statistics/863917/number-crypto-coins-tokens/. Last accessed on September 4, 2024. From 2,817 crypto-assets recognised in November 2019 to 10,025 in August 2024.

[22] See Thakur, A., & Verma, R. (2022). An Empirical Three Phase Analysis of Crypto Market. Available at: https://www.researchgate.net/publication/359218205_An_Empirical_Three_Phase_Analysis_of_Crypto_Market.

[23] E.g., the European Union's Markets in Crypto-Assets Regulation (Regulation (EU) 2023/1114 of the European Parliament and of the Council of 31 May 2023 on markets in crypto-assets, and amending Regulations (EU) No 1093/2010 and (EU) No 1095/2010 and Directives 2013/36/EU and (EU) 2019/1937) entered into force in June 2023; the United States of America are yet to pass federal bill on this topic, with notable efforts performed with the voting of the Financial Innovation and Technology for the 21st Century Act in the U.S. House of Representatives on May 22, 2024. At the time being, not all States have passed laws that regulate crypto-assets, with a divergent approach in each case.

[24] See "*Stablecoin*" in the *Glossary*.

[25] See, e.g., Recital (7) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[26] See Pupolizio, I. (2022). From libra to diem. the pursuit of a global private currency. *Global Jurist*, *22*(2), 281-306.

[27] *Statement by Diem CEO Stuart Levey on the sale of the Diem Group's assets to Silvergate*, Diem, retrieved from: https://www.diem.com/en-us/updates/stuart-levey-statement-diem-asset-sale/. Published on January 31, 2022. Last accessed on September 4, 2024.

[28] See Uhlig, H. (2022). *A luna-tic stablecoin crash*. National Bureau of Economic Research.

[29] See Briola, A., Vidal-Tomás, D., Wang, Y., & Aste, T. (2023). Anatomy of a Stablecoin's failure: The Terra-Luna case. *Finance Research Letters*, *51*, 103358.

[30] See Liu, J., Makarov, I., & Schoar, A. (2023). *Anatomy of a run: The terra luna crash*. National Bureau of Economic Research.

where the implementation of a central bank digital currency has the opportunity to shine.

Central bank digital currencies (CBDC) are considered to be the ultimate form of public digital money.[31] Monetary authorities considering the issuance of a CBDC are currently analysing the optimal level of privacy that may align the interests of both the population and the requirements of control laid down by the regulatory framework.[32] In particular, general analyses on the topic of privacy and CBDCs have determined the need for a privacy model that is neither completely anonymous nor fully transparent to balance privacy with dishonest behaviour of certain sectors of the population, namely fraud, money laundering and financing of terrorism.[33]

In this context, the Proposal introduces a privacy design for the digital euro that may not be enough to satisfy the needs of the European Union population,[34] yet it provides an advantage over currently existing conventional digital means of payment, as it diminishes the processing of personal data in online transactions. For its part, offline digital euro payment transactions have been designed to equate operations being performed through an automated teller machine (ATM) in terms of privacy,[35] which may offer a better standard for digital payments in proximity for prospective digital euro users,[36] yet it is not preferable over payments using euro banknotes and coins.[37]

Thus, the analysis presented in the rest of this Chapter addresses the privacy design choices made by the European legislator, focusing on those considerations that may have

[31] See subsection 1.2.3 "*Benefits and cases of use for a CBDC*" in Chapter 1 of the Thesis.

[32] See, e.g., Ahnert, T., Hoffmann, P., & Monet, C. (2022). The digital economy, privacy, and CBDC. The European Central Bank has commissioned this analysis of the adequate level of privacy to be implemented for a given CBDC architecture, as it considers a model in which commercial banks, albeit key partners in the distribution of the CBDC, do not have access to payment transactions data. While this model may be considered as gullible, it is not far from the considerations included in the Proposal, as addressed in section 6.4 "*Data processing by PSPs – Article 34 Proposal*" below, since payment service providers will only be processing personal data as described in Annex III of the Proposal.

[33] See Darbha, S., & Arora, R. (2020). *Privacy in CBDC technology* (No. 2020-9). Bank of Canada.

[34] See subsection 1.3.2 "*Initial concerns of the population*" in Chapter 1 of the Thesis.

[35] See subsection 6.7.3 "*Offline transactions and their equivalence to an ATM withdrawal*" below.

[36] This is without prejudice of the content of subsection 5.2.3.1 "*The special consideration for transactions in a proximity payment – Article 23(3) Proposal*" in Chapter 5 of the Thesis.

[37] See, e.g., *A digital euro: widely available and easy to use - Introductory statement by Fabio Panetta, Member of the Executive Board of the ECB, at the Committee on Economic and Monetary Affairs of the European Parliament*, European Central Bank – Eurosystem. Retrieved from: https://www.ecb.europa.eu/press/key/date/2023/html/ecb.sp230424_1~f44c7ac164.en.html. Published on April 24, 2023. Last access on September 20, 2024. The digital euro is meant to complement euro banknotes and coins, not replace them. Consequently, the European legislator is not required to provide a design for the digital euro that mimics the privacy characteristics of cash, especially when online digital euro payment transactions do provide an improvement in terms of privacy over conventional methods. However, prospective digital euro users are expecting adequate privacy measures, as pointed out in *supra* note 34. Therefore, the implementation of suboptimal standards of privacy for digital euro payment transactions may disincentivise its adoption, deeming its issuance futile.

the most impact in the adoption of the digital euro, as well as providing alternatives that may be considered by the European Union authorities should they revise their strategy for privacy requirements in the final version of the Proposal.

6.3 Chapter VIII of the Proposal: Privacy and Data Protection

Chapter VIII ("*Privacy and data protection*") of the Proposal[38] addresses the implications surrounding the data processing by payment service providers (PSPs), the European Central Bank, and the national central banks, as well as providers of support services.[39] Articles 34 to 36 of the Proposal include the relevant considerations concerning this topic, with references to Annexes III, IV and IV respectively. These articles are structure to mirror each other's content, which enables the possibility to analyse first the common ground for all three, before considering the specifics of each one. Consequently, this section analyses common considerations in all three provisions and the next three sections[40] analyse the processing of data by each of the operators separately.

6.3.1 Common content in Chapter VIII

Chapter VIII of the Proposal presents a structure for the three Articles that are included in it that shares similarities in the data to be processed by each of the mentioned operators. Unless otherwise mentioned, the following analysis can be applied to all three Articles.

[38] See *supra* note 1.

[39] Should the European Central Bank decide to confer tasks referred to in Article 27 and 32 of the Proposal, pursuant to the content of Article 36, point 1. See section 6.6 "*Processing by providers of support services – Article 36 Proposal*" below.

[40] See sections 6.4 "*Data processing by PSPs – Article 34 Proposal*", 6.5 "*Processing by the ECB and national central banks – Article 35 Proposal*", and 6.6 "*Processing by providers of support services – Article 36 Proposal*" in this Chapter for the analysis of Articles 34, 35 and 36 of the Proposal, respectively.

6.3.1.1 *"Public interest or official authority"*

The Proposal states that PSPs,[41] the European Central Bank and the national central banks,[42] and providers of support services[43] [44] perform a task in the public interest where they process personal data for the purposes described for each operator. To understand the implications, it is required to review the contents of Regulation (EU) 2016/679 (General Data Protection Regulation or GDPR.)[45] Thus, Articles 5 and 6, as well as Recitals (10) and (45), of said Regulation regulate the processing of personal data when such action is carried out in the public interest.[46]

Consequently, the obligation laid down in GDPR demands that the operators processing personal data in the public interest must show that said processing is required to achieve an objective in the public interest. In other words, more than a mere mention is required to authorise such data processing, with the requirement of showing the data is specifically gathered and processed for the mentioned objective. Otherwise, the processing would be considered unlawful, rendering negative consequences to the operator.[47]

In addition to that, Article 35, point 1, of the Proposal refers to the fact that the European Central Bank exercises official authority when processing personal data for the purposes mentioned there.[48] In that case, the processing of personal data is authorised because the official authority that emanates from European Union law is vested in the operator.[49] Despite its different naming, the consequences and limits applicable are the same, hence its joint treatment in this subsection.

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[41] See Article 34, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[42] ee Article 35, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[43] See Article 36, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[44] Article 36 of the Proposal refers to "*payment services providers*" instead of "*providers of support services*". The content of the article induces the reader to think this is a mistake that should be updated in an upcoming revision of the Proposal.

[45] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation.)

[46] See Articles 5 ("*Principles relating to processing of personal data*") and 6 ("*Lawfulness of processing*"), point 1, letter (e), of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).

[47] *Id*.

[48] See *supra* note 42.

[49] See *supra* note 45.

6.3.1.2 Controller of the data and state-of-the-art measures

In addition to the considerations analysed in the previous sub-section, the Proposal establishes that PSPs,[50] the European Central Bank,[51] [52] and providers of support services[53] shall be considered the controllers of personal data as regards the purposes defined for each in Articles 34, 35 and 36 of the Proposal respectively. This consideration imposes a set of obligations to the operators that are meant to ensure appropriate measures to ensure adequate processing of the personal data.

In accordance with Article 4, point 7, GDPR,[54] "*controller*" means the natural or legal person, public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data; where the purposes and means of such processing are determined by Union or Member State law, the controller or the specific criteria for its nomination may be provided for by Union or Member State law. In the case of this Proposal, all the operators considered in Chapter VIII belong in the second consideration, as the purposes and means of the processing have been pre-determined by a legal act that emanates from the European Union.

For its part, Chapter IV of GDPR[55] determines the obligations that are imposed to the operator who is considered as a controller of the personal data to be processed. In particular, Article 24, point 1, GDPR[56] determines that the controller shall implement appropriate technical and organisational measures to ensure and to be able to demonstrate

[50] See Article 34, point 3, second paragraph, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[51] See Article 35, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[52] In particular, Article 35, point 5, of the Proposal establishes that the European Central Bank shall be considered the controller of personal data. Only when the tasks described in the Article are carried out jointly with the national central banks, they shall be considered joint controllers. Joint controllers are regulated under Article 26 GDPR.

[53] See Article 36, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[54] See Article 4 ("*Definitions*"), point 7, of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation or GDPR.)

[55] See Chapter IV ("*Controller and processor*") of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation or GDPR.)

[56] See Article 24 ("*Responsibility of the controller*"), point 1, of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation or GDPR.)

that processing is performed in accordance with the content of said Regulation. This is another common mandate for PSPs,[57] the European Central Bank and national central banks,[58] and providers of support services.[59] In particular the Proposal determines that the processing of personal data for the purposes described in each case shall only take place when appropriate technical and organisational measures including state-of-the-art security and privacy preserving measures are implemented to ensure that the identity of digital euro users cannot be inferred from the data processed and communicated to the European Central Bank, the national central banks and providers of support services where needed.[60] The most important consequence of this reference is the fact that the personal data that will be processed shall be anonymised, which minimises the impact of prospective data breaches. This allows for a proper processing of the digital euro usage directly by the European Central Bank and the rest of the relevant authorities involved, which is important for technical reasons to improve the system over time, yet it becomes essential for the monetary policy of the euro area. One of the best features that may come along with the digital euro is the availability of data in real time of money supply and cash flows. Aggregated data, while still anonymous, can be of great utility for the ECB in terms of monetary policy.

There is, however, an additional particularity concerning Article 35 of the Proposal that requires being addressed separately. While the language in point 4 of Articles 34 and 36 of the Proposal uses the active voice, hence directly imposing an obligation to PSPs and providers of support services to implement adequate state-of-the-art measures,[61] Article 35, point 4, of the Proposal presents the same statement using the passive voice, hence avoiding the imposition of such measures to the European Central Bank and national central banks.[62] Despite its minimal implications in the Proposal, it would require a justification coming from the European legislator, as this was intentionally included as it is, circumventing the imposition of any obligations on the topic to the monetary authorities.

[57] See Article 34, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[58] See Article 35, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[59] See Article 36, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[60] See *supra* notes 57, 58, and 59.

[61] See *supra* notes 57 and 59.

[62] See *supra* note 59.

6.3.1.3 Delegated acts in accordance with Article 38

Article 38 of the Proposal confers on the European Commission the power to adopt delegated acts[63] for an indeterminate period of time from the date of entry of force of the Proposal,[64] yet it may be revoked at any time by the European Parliament or by the Council of the European Union.[65] Said power is explicitly referenced in Articles 34,[66] 35[67] and 36,[68] enabling the European Commission to update the types of personal data listed in Annexes III, IV and V of the Proposal, respectively. This provision enables the possibility of performing changes in the types of personal data that each operator may lawfully processed in the future, and it is presented in the Proposal as a solution to adapt its contents to upcoming needs that may be overlooked at this time.

It must be mentioned that Article 38 of the Proposal does not reference Article 36 when enabling the European Commission to adopt delegated acts.[69] However, this is the result of a printing mistake and it should never be considered as a limitation on this direction.[70]

6.3.1.4 Minimum amount of data to be processed

Finally, the obligation to process the minimum amount of data that is required to comply with the purposes described in Chapter VIII of the Proposal is also addressed in Articles 34 to 36, albeit in an indirect format.

According to the principles relating to processing of personal data laid down in Article

[63] See Article 38, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[64] See Article 38, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[65] See Article 38, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[66] See Article 34, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[67] See Article 35, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[68] See Article 36, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[69] See Article 38, points 2, 3 and 6, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Only Articles 11, 33, 34 and 35 are expressly mentioned.

[70] Article 33 is mentioned erroneously. The enumeration included in Article 38 should read "*Articles 11, 34, 35 and 36*" since Article 33 does not address the possibility of enabling the European Commission to adopt delegated acts to update its content. This printing error must have been originated on the reference to the previous structure of the Proposal, before the addition of a new Article, hence the mistake.

5 GDPR,[71] controllers of personal data are required to collect personal data for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes,[72] with said personal data being adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed.[73] This is in line with the objectives of the Proposal as a whole and of Chapter VIII in particular, as the digital euro has been designed to maximise the utility of its users while respecting their privacy to the maximum extent,[74] considering as limitations in this direction the purposes lawfully recognised in Articles 34 to 36.

6.4 Data processing by PSPs – Article 34 Proposal

Article 34 of the Proposal outlines the responsibilities of PSPs concerning the processing of personal data in connection with the digital euro.[75] Point 1 enumerates the purposes in which PSPs are considered to be performing a task in the public interest when processing personal data and limits the data processed for offline digital euro transactions.[76] Point 2 references Annex III[77] for the types of personal data that can be processed for the purposes described previously,[78] while point 3 enables the European Commission to update these data types through delegated acts.[79] In addition, said point designates PSPs

[71] See Article 5 ("*Principles relating to processing of personal data*") of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation or GDPR.)

[72] See Article 5, point 1, letter b), of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation or GDPR.)

[73] See Article 5, point 1, letter c), of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation or GDPR.)

[74] See, e.g., Recitals (71), (72) and (77) of the of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Data processing minimisation is a recurrent topic throughout the entire Proposal.

[75] See Article 34 ("*Processing by payment service providers*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[76] See Article 34, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[77] See Annex III ("*Personal data processed by PSPs*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[78] See Article 34, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[79] See Article 34, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

as the controllers of personal data.[80] Finally, point 4 of the Article establishes that PSPs must implement advanced security and privacy measures to ensure that any data shared with the European Central Bank, national central banks, or support service providers do not directly identify individual digital euro users.[81]

In order to address all relevant provisions included in Article 34 of the Proposal, this section is structured as follows: first, the lawful purposes for data processing by PSPs, as described in point 1 of Article 34, are addressed. Second, the differences that arise in data processing concerning online and offline digital euro payment transactions are analysed.

6.4.1 Purposes *ex* article 34(1)

Article 34, point 1, addresses the purposes in which PSPs perform a task in the public interest when processing personal data of digital euro users.[82] The list provided references other Articles of the Proposal in order to link the necessity to the action that is performed by PSPs. Thus, the processing of personal data is enabled in letter a)[83] to enforce the holding limits referred to in Article 16 of the Proposal;[84] [85] in letter b)[86] to enable the funding and defunding operations as described in Article 13, points 2 and 3, as well as the waterfall and reverse waterfall functionalities in point 4 of said article;[87] in letter c)[88] for the provision of offline digital euro, including the process described in letter b) of Annex I;[89] in letter d)[90] to comply with sanctions as referred to in Article 29;[91] [92] and in letter e)

[80] *Id*.

[81] See Article 34, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[82] See *supra* note 41.

[83] See *supra* note 76, letter a).

[84] See Article 16 ("*Limits to the use of the digital euro as a store of value*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[85] See subsection 3.2.3 "*Limits to the use of the digital euro as a store of value - Article 16 Proposal*" in Chapter 3 of the Thesis.

[86] See *supra* note 76, letter b).

[87] See Article 13, points 2, 3 and 4 of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[88] See *supra* note 76, letter c).

[89] See letter (b) of the Annex I to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. The registration and de-registration of the local storage devices requires the minimal processing of personal data.

[90] See *supra* note 76, letter d).

[91] See Article 29 of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[92] See subsection 5.3.5 "*Verification of sanctions – Article 29 Proposal*" in Chapter 5 of the Thesis.

referring to several obligations of PSPs concerning the execution of transactions and the prevention and detection of fraud,[93] anti-money laundering (AML) and counter terrorist financing (CFT) measures,[94] [95] as well as taxation compliance[96] and other obligations.[97] [98] Concerning offline digital euro payment transactions, the processing of personal data by PSPs is limited to funding and defunding operations, in accordance with Article 37, points 3 to 5, of the Proposal.[99] Due to the specific considerations surrounding offline payment transactions, the implications of this provision are addressed in the next sub-section.[100]

Despite the apparent lengthy list of purposes, the processing of personal data by PSPs is rather limited considering the wide variety of processes in which they are involved according to the Proposal, in line with the objective of minimum amount of data to be processed.[101] What can be inferred from this list is that the processing of personal data is expected to be limited to technical requirements, prevention of fraud, money laundering and financing of terrorism and taxation compliance. While the first four categories are explicitly considered throughout the Proposal, the last one is introduced here for the first time. Digital euro transactions can be of great help to improve taxation in Member States due to its inherent digital nature,[102] yet there are no specific considerations in the Proposal that benefit from it, aside from this one. The Proposal could benefit from an addition of this nature, especially when the relevant literature on the topic of taxation has already addressed the expected benefits of the implementation of a CBDC.[103]

[93] See *supra* note 76, letter e). Letter e) refers to the obligations of PSPs under Directive (EU) 2015/2366 (PSD2) related to the execution of transactions and the prevention and detection of fraud.

[94] See *supra* note 76, letter e). Letter e) also refers to combatting money laundering and terrorist financing under Directive (EU) 2015/849 (Prevention of money laundering).

[95] See section 6.7 "*Anti-Money Laundering – Chapter IX – Article 37 Proposal*" below.

[96] See *supra* note 76, letter e). Letter e) also refers to taxation compliance under Council Directive 2006/112/EC (on the common system of value added tax -VAT-), Directive (EU) 2011/16/EU (on administrative cooperation in the field of taxation) and relevant national law.

[97] See *supra* note 76, letter e). Letter e) also refers to the management of operational and security risks under Regulation (EU) 2022/2554 (on digital operational resilience for the financial sector) and other obligations under Directive (EU) 2014/92/EU (Access to payment accounts with basic features.)

[98] It could be argued that Article 5 ("*Applicable law*") of the Proposal should be updated to include those sources of primary law that are considered here, yet they are not included as applicable law for the processes described in the Proposal.

[99] See Article 37, points 3, 4 and 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[100] See subsection 6.4.2 "*Data processed in online and in offline transactions*" below.

[101] See subsection 6.3.1.4 "*Minimum amount of data to be processed*" above.

[102] See, e.g., Chapter 2 ("*The legal tender status of the digital euro*") of the Thesis. The legal tender status of the digital euro ensures its acceptance by most merchants in the euro zone, with the exception of the considerations included in Chapter III ("*Legal tender*") of the Proposal.

[103] See Ren, D., Guo, H., & Jiang, T. (2023). Managed anonymity of CBDC, social welfare and taxation: A new monetarist perspective. *Applied Economics*, *55*(42), 4990-5011. See also Wang, Z. (2020). Tax compliance, payment choice, and central bank digital currency. *Payment Choice, and Central Bank Digital*

6.4.2 Data processed in online and in offline transactions

The specific type of personal data that is processed by PSPs considering the lawful purposes from letters a) to c) in Article 34, point 1, can be found in Annex III to the Proposal.[104] [105] Consequently, the personal data to be processed pursuant to letters d) and e) is not specified in the Proposal and requires specific review for each case. Additionally, only funding and defunding data is processed for offline digital euro payment transactions, which should not be confused with the provision of offline digital euro in letter c) of Article 34.[106] [107]

Analysing the content of Annex III enables the possibility to understand each of the scenarios described in the previous point of Article 34. Despite the common types of personal data that are presented in Annex III, it is recommended the analysis of each purpose separately.

Thus, for the purpose of letter a) -holding limits pursuant to Article 16-,[108] processing shall be limited to the user identifier,[109] the user authentication,[110] information on digital euro payment accounts; including information on digital euro holdings[111] of the digital euro user and the unique digital euro payment account number;[112] and information on online digital euro payment transactions, including the transaction identifier[113] and the transaction amount according to number 1 of Annex III.[114] With the exception of a few oddities in the definition of the categories,[115] the type of data that is processed for this purpose sustains no difficulties in the analysis.

Currency (November 2020). For an analysis on the context of the digital euro, see Scarcella, L. (2021). The implications of adopting a European Central Bank Digital Currency: a tax policy perspective. *EC Tax Review*, *30*(4).

[104] Annex III ("*Personal data processed by PSPs*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[105] Annex III is referenced by Article 34, point 2, of the Proposal.

[106] Article 34, point 1, last paragraph, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[107] Letter c) refers to the provision of offline digital euro, which means the initial set up for a mobile device that authorises it use as a means of payment for offline transactions with digital euro. While this is not expressed explicitly in Article 34 of the Proposal, it can be inferred from the types of personal data that are processed pursuant to letter c) according to Annex III.

[108] See *supra* note 83.

[109] See "*User identifier*" in the *Glossary*.

[110] See "*User authentication*" in the *Glossary*.

[111] See "*Digital euro holdings*" in the *Glossary*.

[112] See "*Unique digital euro account identifier*" in the *Glossary*.

[113] See "*Transaction identifier*" in the *Glossary*.

[114] See Annex III, point 1, to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[115] See *supra* note 107.

Next, for the purpose of letter b) -funding and defunding pursuant to Article 13-,[116] processing shall be limited to the user identifier, the user authentication, information on digital euro payment accounts, including the unique digital euro payment account number; and information of non-digital euro payment accounts, including the account number of the linked non-digital euro payment account, according to number 2 of Annex III.[117] In this case, contrary to letter a) above, there is no reference to processing data that concerns the transaction itself, but information concerning the non-digital euro payment account used for funding or defunding is processed.

Finally, for the purpose of letter c) -the provision of offline digital euro-,[118] processing shall be limited to the user identifier, including the name of the local storage device holders, and information on the local storage device, including the identifier of the local storage device[119] according to number 3 of Annex III.[120] In this case, the provision of offline digital euro requires linking the user identifier information to the local storage device[121] that will be used for offline transactions, hence the specific need for these types of personal data. In any case, the processing of personal data in offline digital euro payment transactions is regulated in Article 37 of the Proposal, under Chapter IX.[122] While the adequacy of its location in the Proposal is debatable,[123] the in-depth analysis of its specific considerations is performed later in this chapter.[124]

[116] See *supra* note 86.
[117] See Annex III, point 2, to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[118] See *supra* note 88.
[119] See "*Local storage device identifier*" in the *Glossary*.
[120] See Annex III, point 3, to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[121] See "*Local storage device*" in the *Glossary*.
[122] See Article 37 ("*Anti-money laundering rules applying to offline digital euro payment transactions*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[123] Introducing the processing of personal data by PSPs of offline digital euro payment transactions in Article 34 of the Proposal while actually addressing it in Article 37, points 3, 4 and 5, may confuse the reader. Data processing concerning offline digital euro payment transactions should have addressed altogether in the same provision, or at least in the same Chapter of the Proposal.
[124] See subsection 6.7.3 "*Offline transactions and their equivalence to an ATM withdrawal*" below.

6.5 Processing by the ECB and national central banks – Article 35 Proposal

Article 35 of the Proposal outlines how the European Central Bank (ECB) and national central banks will process personal data when performing tasks related to the digital euro.[125] Point 1 depicts the purposes in which the ECB or the national central banks perform a task in the public interest or exercise official authority where they process personal data.[126] . Point 2 references Annex IV,[127] which limits the personal data types to be processed by the ECB and the national central banks.[128] Point 3 enables the possibility of adopting delegated acts to update the list of personal data types laid down in Annex IV.[129] Point 4 refers to state-of-the-art security and privacy-preserving measures.[130] For its part, point 5 refers to the consideration of the ECB and/or the national central banks as the controller of personal data.[131] However, according to point 6, this Article does not affect the ECB's and national central banks' other roles as monetary authorities.[132] For its part, point 7 reviews how data processed by providers of support services according to Article 36 and Annex V[133] could be processed by the ECB instead.[134] Finally, point 8 refers to the establishment of a single access point of digital euro identifiers and the related digital euro holding limits as referred to in point (4) of Annex IV.[135] For its part,

[125] See Article 35 ("*Processing of personal data by the European Central Bank and the national central banks"*) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[126] See Article 35, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[127] See Annex IV ("*Personal data processed by the European Central Bank and national central banks*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[128] See Article 35, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[129] See Article 35, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[130] See Article 35, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[131] See Article 35, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[132] See Article 35, point 6, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[133] See Annex V to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[134] See Article 35, point 7, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[135] See Article 35, point 8, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

the content of Article 35, point 7, of the Proposal will be addressed in the next section, as it makes the most sense thematically.[136]

6.5.1 Differences with Article 34 Proposal

As previously stated,[137] all three articles included in Chapter VIII share a similar structure that mirror the contents of each other. For its part, Article 35 presents three essential differences with Article 34, which are now to be addressed.

First, Article 35, points 1 and 2, introduce different purposes to justify the processing of personal data,[138] as well as different types of personal data to be processed pursuant to Annex IV of the Proposal.[139] Thus, the European Central Bank and the national central banks perform a task in the public interest or exercise official authority[140] where they process personal data for purposes such as the provision of access for PSPs to the digital euro settlement infrastructure and support the exchange of messages between them when needed,[141] [142] the settlement of online digital euro payment transactions,[143] safeguarding the security and integrity of the digital euro settlement infrastructure and of local storage devices,[144] [145] supporting the verification of holding limits in accordance with Article 16,[146] [147] and, in exceptional circumstances, authorising the emergency switching described in Article 31 of the Proposal.[148] [149]

[136] See subsection 6.6.2 "*Concerning Article 35(7)*" below.
[137] See section 6.3 "*Chapter VIII of the Proposal: Privacy and Data Protection*" above.
[138] See *supra* notes 126 and 128.
[139] See *supra* note 6.5.
[140] See subsection 6.3.1.1 "*"Public interest or official authority"*" above.
[141] See Article 35, point 1, letter a), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[142] See, e.g., subsection 5.3.3 "*Dispute mechanism – Article 27 Proposal*" in Chapter 5 of the Thesis. However, the European legislator could also be hinting the existence of a "*messaging intranet*" supported by the European Central Bank to ensure an adequate flow of information between relevant actors in the digital euro settlement infrastructure.
[143] See Article 35, point 1, letter b), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[144] See "*Local storage device*" in the *Glossary*. The express mention to local storage devices must be seen as a reference to the settlement of offline digital euro payment transactions, despite the apparent lack of specific measures in this Chapter of the Proposal for that modality of the digital euro.
[145] See Article 35, point 1, letter c), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[146] See *supra* note 84.
[147] See Article 35, point 1, letter d), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[148] See Article 31 ("*Switching of digital euro payment transactions*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[149] See Article 35, point 1, letter e), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT

For the purposes listed in the previous paragraph, Article 35, point 2, references that Annex IV to the Proposal[150] lays down the types of personal data to be processed.[151] In particular, processing shall be limited to information on digital euro payment accounts, including the unique digital euro payment account number and information on online digital euro payment transactions including the unique digital euro payment account number, as well as the transaction amount[152] and the user alias,[153] the user authentication,[154] the reference to digital euro holdings to debit and the reference to digital euro holdings to credit,[155] where applicable.[156] In addition to that, Annex IV to the Proposal includes specific references to the data required for counterfeit analysis of offline digital euro payment transactions, including the local storage device and its number,[157] [158] and for the establishment of the single access point,[159] which will be limited to the user identifier, the user authentication, and information on digital euro payment accounts, including the unique digital euro payment account number, digital euro holdings of the user, the holding limit selected by the user[160] and the type of digital euro account.[161]

AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[150] See *supra* note 6.5.

[151] See *supra* note 128.

[152] See point 1, paragraphs (i) and (ii), of the Annex IV to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Processing of the personal data listed there shall be limited to the purposes included in letter a) of Article 35, point 1, of the Proposal.

[153] See "*User alias*" in the *Glossary*.

[154] See "*User authentication*" in the *Glossary*.

[155] See "*Digital euro holdings*" in the *Glossary*.

[156] See point 2, paragraphs (i) and (ii), of the Annex IV to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Processing of the personal data listed there shall be limited to the purposes included in letter a) of Article 35, point 1, of the Proposal. Processing of the personal data listed there shall be limited to the purposes included in letter a) of Article 35, point 1, of the Proposal.

[157] See point 3 of the Annex IV to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[158] Counterfeit analysis of offline digital euro payment transactions is not addressed anywhere in the Proposal. However, the European legislator makes explicit its concern in Annex IV, evidencing that its analysis has been taken into consideration when designing the Proposal. A proper technical, albeit legal, analysis on the topic could have been included in Chapter VII ("*Technical features*") of the Proposal. The European legislator is encouraged to consider its inclusion in the definitive version of the Proposal.

[159] See subsection 6.5.3 "*Single access point*" below.

[160] See subsection 3.2.3.2.2 "*Holding limits in Article 16(4)˝* in Chapter 3 of the Thesis.

[161] Different types of digital euro payment account are not addressed anywhere in the Proposal, although it could be inferred from its content that the distinction may arise concerning the availability of basic digital euro payment services as laid down in Annex II of the Proposal or additional services that may be implemented for digital euro users, as addressed in subsection 3.3.3 "*Free for natural persons on basic digital euro payment services - Article 17(1) and Annex II Proposal*" in Chapter 3 of the Thesis. In any case, the European legislator is encouraged to improve the language used to clarify whether alternative distinctions should be considered when categorising digital euro payment accounts.

Second, as previously mentioned,[162] Article 35, point 4, of the Proposal uses the passive voice to avoid imposing an explicit obligation to the European Central Bank and the national central banks in terms of implementation of technical and organisational measures including state-of-the-art security and privacy preserving measures.[163] While Article 34, point 4, of the Proposal[164] explicitly imposes the obligation to implement such measures to PSPs, the reference here is presented in passive voice, without determining the compelled party. Although it can be inferred that the Proposal is expecting the ECB and the national central banks to take charge of it, the way in which this provision is presented is not trivial, as the current language does not directly impose any obligation onto them.

Finally, third, point 5 of Article 35 enables the possibility of considering the European Central Bank and the national central bank as joint controllers of the personal data when acting together in a given task under the considerations of the article.[165]

6.5.2 Other data processed by the European Central Bank

For its part, Article 35, point 6, of the Proposal determines that the content of the rest of the Article it is without prejudice to the processing of personal data involved in the performance of the other tasks and powers, including for the supervision of credit institutions and the oversight of payment systems, of the European Central Bank.[166] This provision makes explicit that the purposes and types of personal data processed by the European Central Bank and the national central banks can go beyond of the content of the Proposal, because of their interaction with data to be processed in other tasks related to the consideration of monetary authority of the euro zone.[167]

[162] See subsection 6.3.1.2 "*Controller of the data and state-of-the-art measures*" above.
[163] See *supra* note 130.
[164] See *supra* note 81.
[165] See *supra* note 131.
[166] See *supra* note 132.
[167] See, e.g., *Data protection – Privacy statement for the processing of personal data related to fee collection*, European Central Bank – Banking Supervision. Retrieved from: https://www.bankingsupervision.europa.eu/organisation/fees/data/html/index.en.html. Last accessed on September 11, 2024. This statement provides an example of the performance of other tasks and powers of the European Central Bank that require the processing of personal data and that should be addressed separately from the content of Article 35 of the Proposal.

6.5.3 Single access point

The last entry in Article 35 includes a major consideration concerning data processing that involves the European Central Bank and, where appropriate, national central banks. Thus, point 8[168] of said Article determines that the European Central Bank may establish a single access point of digital euro identifiers and the related digital euro holding limits as referred to in point 4 of Annex IV,[169] for the purpose of supporting the tasks associated with enforcing the holding limits set out in Article 16, point 1,[170] [171] and ensuring the emergency switching as described in Article 31, point 2 of the Proposal.[172] [173] Point 4 of Annex IV determines that data processing referred to the single access point shall be limited to the user identifier, the user authentication, related to user's existing euro holdings and information on digital euro payment accounts, including the unique digital euro payment account number, digital euro holdings of the user, the holding limit selected by the user[174] and the type of digital euro account.[175]

Two main questions arise from the review of both provisions: what the single access point is and what the implications of its existence are. Accordingly, they are addressed in the next subsections.

6.5.3.1 Definition

Despite its importance, the single access point referred to in Article 35, point 8,[176] is not defined anywhere in the Proposal. While the aforementioned provision references Annex IV of the Proposal,[177] a definition is neither provided there. Because of its implications, an appropriate definition of what it entails is necessary.[178]

[168] See *supra* note 135.
[169] The Proposal mistakenly references "*Annex 4*" instead of "*Annex IV*" here.
[170] See Article 16, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[171] See subsection 3.2.3.1 "*The necessity for limits - Recitals (2), (3), (24), (37), (49) and Article 16(1) Proposal*" in Chapter 3 of the Thesis.
[172] See Article 31, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[173] See subsection 5.3.7 "*Switching of digital euro payment accounts – Article 31 Proposal*" in Chapter 5 of the Thesis.
[174] See "*Overall holding limit*" in the *Glossary*.
[175] There is no given definition for the "*type*" of digital euro payment account, as it is not defined anywhere in the Proposal, despite being hinted here. The European legislator is encouraged to provide one.
[176] See *supra* note 135.
[177] See *supra* note 6.5.
[178] The European legislator is encouraged to provide an adequate definition of the single access point, unless its omission could be justified on a concrete basis. In that case, the justification could have been

Accordingly, the single access point[179] may be defined based on the content and references present in both Article 35, point 8, and Annex IV of the Proposal: a unified database concerning the personal data that is defined in point 4 of Annex IV to the Proposal. Said information shall be available at all times, being updated in real time by PSPs, and should be in possession of the European Central Bank to ensure both holding limits laid down in Article 16 and the emergency switching described in Article 31 can be guaranteed.

6.5.3.2 Implications

The implementation of the single access point constitutes an adequate example of system resilience. While contingency or continuity plans are the standard in digital industries,[180] appropriate system design includes backups of information that are stored in different data centres. By doing this, the adverse and pervasive effects associated to catastrophic events that may prevent PSPs from providing digital euro services can be minimised. In addition to that, the European Central Bank and the national central banks, when applicable, are the appropriate owners of the single access point since they are in the best position to assist the impacted PSPs.

The implementation of the single access point is also meant to improve the capabilities of the digital euro by ensuring adequate enforcing of holding limits pursuant to Article 16 of the Proposal. Since interoperability is guaranteed for digital euro users,[181] relevant information on the topic of holding limits must be available for all operators involved. As long as the identity of individual digital euro users is not at stake,[182] the existence of the single access point allows for the immediate verification of holdings for any user, ensuring instant, yet lawful, transactions.

Additional implications may be considered in the future in accordance with the language used by the European legislator in the last sentence of the provision. Thus, the

provided.

[179] See "*Single access point*" in the *Glossary*.

[180] See subsection 5.3.7 "*Switching of digital euro payment accounts – Article 31 Proposal*" in Chapter 5 of the Thesis.

[181] See section 4.2 "*PSPs and digital euro users - Article 13 Proposal*" in Chapter 4 of the Thesis. Digital euro users may access digital euro payment services with a PSP while holding a non-digital euro payment account with a different PSP. They are even allowed to hold different digital euro payment accounts with different PSPs.

[182] See *supra* note 135.

explicit reference to "*customer(s) or potential customer(s)*"[183] may be referring to scenarios in which a PSP is dealing with a potential new digital euro user and is required to perform, using the single access point, the required analysis on holding limits or the verification of sanctions pursuant to Article 29 of the Proposal[184] before authorising the user to create a digital euro payment account or fund it. By doing so, circumvention of holding limits or sanctions is minimised.

6.6 Processing by providers of support services – Article 36 Proposal

Article 36 of the Proposal addresses the processing of personal data by providers of support services, when duly authorised by the European Central Bank.[185] Point 1 enumerates the purposes in which these providers of support services perform a task in the public interest when processing personal data.[186] Point 2[187] references Annex V,[188] which lays down the types of personal data that, according to point 3, can be updated by the European Commission through delegated acts.[189] Point 4 requires the implementation of state-of-the-art and privacy-preserving measures to ensure these providers of support services cannot directly identify individual digital euro users.[190] Finally, point 5 determines that these providers of support services shall be considered the controllers of the personal data they processed pursuant the contents of this Article.[191]

[183] *Id*.
[184] See subsection 5.3.5 "*Verification of sanctions – Article 29 Proposal*" in Chapter 5 of the Thesis.
[185] See Article 36 ("*Processing by providers of support services*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[186] See Article 36, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[187] See Article 36, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[188] See Annex V ("*Personal data processed by providers of support services*") to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[189] See Article 36, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[190] See Article 36, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[191] See Article 36, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

6.6.1 Relevant differences

Following the similarities that exist between all three articles included in Chapter VIII of the Proposal,[192] Article 36 also presents three main differences with Articles 34 and 35. Aside from the following, the content of the article is essentially the same, as already disclosed.

The first main difference arises from the purposes that enable the processing of personal data in Article 36, point 1,[193] as well as the types of personal data enumerated by Annex V.[194] [195] Accordingly, the purposes in which providers of support services perform a task in the public interest are supporting the prevention and detection of fraud across payment service providers in accordance with Article 32 of the Proposal,[196] [197] and supporting the exchange of messages for the resolution of disputes in accordance with Article 27 of the Proposal,[198] [199] both being actions that have already been addressed in the previous chapter.[200] Concerning the types of personal data that may be lawfully processed, Annex V only includes an enumeration that affects the prevention and detection of fraud.[201] In this sense, processing shall be limited to information on digital euro payment accounts, including the unique digital euro account identifier,[202] information on online digital euro payment transactions, including the transaction amount,[203] and information on the transaction session of a digital euro user, including the device internet protocol

[192] See section 6.3 "*Chapter VIII of the Proposal: Privacy and Data Protection*" above.
[193] See *supra* note 186.
[194] See *supra* note 188.
[195] Article 36, point 2, of the Proposal references Annex V.
[196] See Article 32 ("*General fraud detection and prevention mechanism*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[197] See Article 36, point 1, letter (a), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[198] See Article 27 ("*Dispute mechanism*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[199] See Article 36, point 1, letter (b), of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[200] See subsection 5.3.8 "*General fraud detection and prevention mechanism – Article 32 Proposal*" in Chapter 5 of the Thesis.
[201] Article 36, point 1, letter (b) is not included in Annex V of the Proposal. The European legislator may have omitted it from the Annex because of the lack of personal data to be processed when supporting the exchange of messages for the resolution of disputes but its inclusion in Article 36 hints that it is necessary to clarify which data is expected to be processed, hence requiring its inclusion in the Annex. A revision is, therefore, encouraged.
[202] See Annex V, point (i), to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[203] See Annex V, point (ii), to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

address-range (IP address.)[204] [205] The inclusion of the IP address in the processing of data for prevention of fraud makes the most sense, since it provides relevant information on the device used for payments, the network to which it is connected and its presumed location.[206] Under PSD2, this information is meant to be processed in real time and prevents transactions that are considered fraudulent,[207] although it has been deemed as frustrating from time to time by users.[208] The implementation of the digital euro, aligned with the upcoming PSD3,[209] is a good opportunity to improve this system.

The second difference appears in point 4 of Article 36, as the Proposal requires the implementation of state-of-the-art security and privacy-preserving measures[210] to ensure that the providers of support services cannot directly identify individual digital euro users. While these operators are not expected to identify individual users, this scenario is only unlikely, yet not impossible due to the nature of the data to which they have access, namely the unique digital euro account identifier. Should a PSP experience a data breach, relevant data linking the unique digital euro account identifier to other attributes of digital euro user would be available online. Since that identifier is expected not to change over time,[211] providers of support services may be able to identify digital euro users with just the personal data they are entitled to process, although it can be argued that this is not connected to their actions, which are the ones being regulated in Article 36.

Finally, the third particularity can be found on Article 36, point 5.[212] While providers of support services are expected to be considered to be the controllers of personal data for the purposes described in point 1, this is without prejudice to the European Central Bank and the national central banks appointing the operators of any payment-related

[204] See Annex V, point (iii), to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[205] See "*Internet protocol address-range (IP Address)*" in the *Glossary*.

[206] See *IP Geolocation - How It Works*, Geo Targetly. Available at: https://geotargetly.com/blog/how-ip-geolocation-works. Last accessed on September 3, 2024. Location data associated to the IP address may be altered using a virtual private network (VPN), hence altering the efficiency of the anti-fraud system here described.

[207] See *supra* note 200.

[208] See subsection 5.3.8.2 "*Improvements included in article 32(3) Proposal*" in Chapter 5 of the Thesis.

[209] Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on payment services and electronic money services in the Internal Market amending Directive 98/26/EC and repealing Directives 2015/2366/EU and 2009/110/EC (PSD3).

[210] See subsection 6.3.1.2 "*Controller of the data and state-of-the-art measures*" above. While the first part of Article 35, point 4, is in line with Articles 34 and 35 of the Proposal, the last sentence is additionally included.

[211] See subsection 5.2.2 "*Design of the digital euro – Article 22(2), (3), (4) and (5) Proposal*" in Chapter 5 of the Thesis.

[212] See *supra* note 191.

services across PSPs and auditing of the service performance level without processing any personal data.[213] This provision is necessarily linked to Article 17 of the Proposal[214] and, as described, does not involve the processing of any personal data, yet it is clarified.

6.6.2 Concerning Article 35(7)

Article 36, point 1, of the Proposal begins with a particular consideration: "*Where the European Central Bank decides to confer tasks referred to in Article 27 and 32 upon providers of support services* [...]"[215] Despite its explicit appearance throughout the Proposal, providers of support services are not guaranteed to be in charge of the tasks provided by the ECB in Articles 27[216] and 32 of the Proposal.[217] In fact, Article 35, point 7, of the Proposal establishes that, in the scenario in which said tasks are not conferred upon providers of support services, the European Central Bank may process the types of data referred to in Annex V[218] subject to the requirements of Article 35, point 4, of the Proposal.[219]

While this scenario seems unlikely, it is sensible to have an express consideration included to avoid a gap during the implementation of the digital euro. However, it may be argued that regulating the existence of providers of support services in depth while including an alternative approach in the Proposal may not be the best design for the upcoming Regulation: once the European Central Bank decides to confer those tasks, all these references are futile. The European legislator may consider an alternative structure, especially when everything in the Proposal invites to believe that providers of support services will be performing the tasks here described.[220]

[213] *Id*.
[214] See Article 17 ("*Fees on digital euro payment services*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[215] See *supra* note 186.
[216] See *supra* note 198.
[217] See *supra* note 196.
[218] The Proposal refers mistakenly to "*Annex 5*" instead of "*Annex V*" in Article 35, point 7, of the Proposal.
[219] See *supra* note 134.
[220] The Proposal must be written with a sense of permanence. Including a reference that may never be applicable because of how it is designed feels inefficient, hence the recommendation.

6.7 Anti-Money Laundering – Chapter IX – Article 37 Proposal

Chapter IX ("*Anti-money laundering*") of the Proposal,[221] addresses the anti-money laundering (AML) and combating the financing of terrorism (CFT)[222] measures strategy of the European Union for the digital euro.[223] As it has been previously noted in this chapter,[224] Chapters VIII and IX of the Proposal must be reviewed together, as the most obvious limitation to privacy is the implementation of the AML/CFT framework. Thus, while Articles 34 to 36 of the Proposal delimit the types of personal data the relevant operators may gather, and to what extent, Article 37 determines which data those operators must retain.[225]

Only Article 37 has been incorporated in Chapter IX of the Proposal, despite other references to the AML/CFT framework being present throughout the text.[226] Consequently, the analysis of Article 37 entails the whole section, recommending its study in depth. Thus, point 1 determines that the AML/CFT measures considered in the rest of the Article only to offline digital euro payment transactions.[227] Article 37, point 2, establishes that neither PSPs nor the ECB or the national central banks shall retain transaction data.[228] For its part, point 3 of the Article imposes the obligation on PSPs to retain data concerning funding and defunding, becoming the main AML measure pointed out in the Proposal that impacts privacy.[229] Directly related, funding and defunding data is defined in Article 37,

[221] See Chapter IX ("*Anti-money laundering*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[222] In a not rigorous approach, this set of measures is referred to as "*counter terrorist financing (CTF)*" in Recital (10), as well as "*combating the financing of terrorism (CFT)*" in Article 19 of the Proposal. We adopt the naming convention originated in Article 19.

[223] Despite only referring to "*anti-money laundering*" in the titles of Chapter IX and Article 37 ("*Anti-money laundering rules applying to offline digital euro payment transactions*"), combating the financing of terrorism is also included in the analysis. A revision of both titles is encouraged to ensure homogeneity in the Proposal and other sources of primary law of the European Union.

[224] See section 6.1 "*Introduction to Chapters VIII and IX of the Proposal*" above.

[225] Bear in mind that the content of Chapter IX only applies to offline digital euro payment transactions. According to Recital (80), online digital euro payment transactions are subject to Directive (EU) 2015/849 (Money Laundering Directive). The implications of this consideration are addressed in subsection 6.7.2 "*Offline transactions only*" below.

[226] See subsection 6.7.1 "*References to AML/CFT in Article 14(5) and 19(3) Proposal*" below.

[227] See Article 37, point 1, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[228] See Article 37, point 2, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[229] See Article 37, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

point 4.[230] Article 37, point 5, enables the European Commission to adopt implementing acts setting offline digital euro payment transaction limits and holding limits, as laid out in Article 16 of the Proposal.[231] [232] Finally, point 6 of the Article lays down the considerations that the European Commission must consider when determining the limits described in the previous point.[233]

To perform an adequate analysis of the topics above described, this section is structured as follows: first, the previous references made to AML/CFT measures in the Proposal are addressed, while the present structure for Chapter IX is criticised. Second, the decision on just considering offline digital euro payment transactions in this Chapter of the Proposal is analysed, as well as their equivalence to an ATM withdrawal, as described by the European legislator. Finally, the specific considerations included in the Proposal concerning offline digital euro payment transactions and their holding limits are addressed, focusing on alternative approaches on the limits to be included for these transactions.

6.7.1 References to AML/CFT in Article 14(5) and 19(3) Proposal

Despite only being featured in one article of the Proposal, AML and CFT measures are present in other sections as well. From the perspective of a clear and direct analysis for the reader, the structural design outlined in the Proposal is not ideal, since multiple provisions that are separated need to be considered when addressing money laundering and the financing of terrorism. In this section all references outside Chapter IX are listed and briefly addressed.

In addition to AML and CFT measures being mentioned in the Recitals,[234] the Proposal addresses this topic up to five times before Chapter IX, in Articles 5, 6, 14, 19 and 34. The analysis of their content allows for determining how they interact with the provisions

[230] See Article 37, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[231] See Article 37, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[232] See subsection 3.2.3.2.2.1 "*Online vs. Offline limits - Article 16(4) Proposal*" in Chapter 3 of the Thesis. Despite being discussed before, offline digital euro holding limits were only hinted in Article 16 of the Proposal. It is Article 37, point 5, which confirms their existence, as expected.

[233] See Article 37, point 6, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[234] See Recitals (10), (12), (49), (57), (58), (73), (78), (79), (80), (82) and (83) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. The information included in these Recitals develops the content of the provisions that are addressed in this subsection and, for the most part, its specific subject matter has been addressed previously in this Thesis.

laid down in Article 37 of the Proposal.

First, Articles 5, point 5,[235] and 6, point 3,[236] of the Proposal reference Directive (EU) 2015/849[237] and Regulation (EU) 2015/847,[238] as well as the Proposal for the new Money Laundering Directive, COM/2021/423 final.[239] While it may come as a surprise that said Proposal is not included in the content of Article 5, but in Article 6,[240] what may trouble the reader is that neither of them includes the Proposal for a new Regulation on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, identified as COM/2021/420 final,[241] which is essential to understand the creation of the Anti-Money Laundering Authority of the European Union ("*AMLA*").[242] Despite the fact that, from a structural point of view of the Proposal, it should have been introduced there,[243] the European legislator awaits until Article 14, point 5, to mention its creation, which was still conditional at the time of publication of the Proposal,[244] and the weight it has in the supervision of AML/CFT measures.

[235] See Article 5 ("*Applicable law*"), point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[236] See Article 6 ("*Competent authorities*"), point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[237] Directive (EU) 2015/849 of the European Parliament and of the Council of 20 May 2015 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, amending Regulation (EU) No 648/2012 of the European Parliament and of the Council, and repealing Directive 2005/60/EC of the European Parliament and of the Council and Commission Directive 2006/70/EC (Money Laundering Directive.)

[238] Regulation (EU) 2015/847 of the European Parliament and of the Council of 20 May 2015 on information accompanying transfers of funds and repealing Regulation (EC) No 1781/2006.

[239] Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the mechanisms to be put in place by the Member States for the prevention of the use of the financial system for the purposes of money laundering or terrorist financing and repealing Directive (EU) 2015/849. COM/2021/423 final.

[240] Article 5 is meant to include all applicable law to the Proposal, even if the legal act is not final yet. For instance, in its point 3, there is an explicit reference to the Proposals COM/2023/366 final and COM/2023/367 final, as they will be replacing Directive (EU) 2015/2366 (PSD2) once they entry into force. Consequently, the Proposal identified as COM/2021/423 final could have been included in Article 5. Despite not appearing there, Article 6 of the Proposal, in charge of listing the competent authorities, introduce it as the upcoming substitute of the Money Laundering Directive. The European legislator is encouraged to ensure the coherence and cohesion of the Proposal.

[241] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing. COM/2021/420 final.

[242] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Authority for Anti-Money Laundering and Countering the Financing of Terrorism and amending Regulations (EU) No 1093/2010, (EU) 1094/2010, (EU) 1095/2010. COM/2021/421 final.

[243] See subsection 6.7.1.1 "*Critique – AML should have been addressed altogether*" below.

[244] See Regulation (EU) 2024/1620 of the European Parliament and of the Council of 31 May 2024 establishing the Authority for Anti-Money Laundering and Countering the Financing of Terrorism and amending Regulations (EU) No 1093/2010, (EU) No 1094/2010 and (EU) No 1095/2010 (Text with EEA relevance).

Thus, Article 14, point 5, of the Proposal[245] acknowledges that the access to the digital euro of several vulnerable groups[246] could be the root for money laundering and terrorism financing issues. Accordingly, said article enables the AMLA and the European Banking Authority (EBA) to jointly issue guidelines specifying the interaction between AML/CFT requirements and the provision of basic digital euro payment services with a particular focus on financial inclusion of those vulnerable groups.[247]

For its part, Article 19, point 3, of the Proposal[248] refers to the necessary implementing measures and procedures, and the cases under which an agreement to distribute the digital euro may be restricted, suspended, or terminated, in particular where the third country has been identified as a country with significant strategic deficiencies in its national anti-money laundering system.[249]

Finally, Article 34, point 1, letter e), of the Proposal references the Money Laundering Directive[250] when addressing the obligations of PSPs related to the execution of transactions and combating money laundering and terrorist financing that emanate from that legal text. This reference enables the control of money laundering for online digital euro payment transactions, as addressed later in this chapter.[251]

6.7.1.1 Critique – AML should have been addressed altogether

The apparent rationale followed by the European legislator to adopt this structure in the Proposal is reasonable: the references to anti-money laundering and combating the financing of terrorism are provided in their needed context throughout the Proposal and, since redundancy is undesired, Chapter IX does not require any additional reference to them.

However, at least two problems arise from this structure in the Proposal. First, redun-

[245] See Article 14, point 5, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[246] See subsection 4.3.3.2 "*Money laundering and vulnerable groups – Article 14(5)*" in Chapter 4 of the Thesis.

[247] *Id*.

[248] See Article 19, point 3, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[249] See subsection 4.4.2.1 "*Agreement and conditions – Article 19(1), (2) and (3) Proposal*" in Chapter 4 of the Thesis. Article 19, point 3, of the Proposal also references the Proposal for a new Regulation on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, identified as COM/2021/420 final, as its Articles 23 and 24 are required to address the level of concern with respect to that third country in terms of AML/CFT measures.

[250] See *supra* note 237.

[251] See subsection 6.7.2 "*Offline transactions only*" below.

dancy is not avoided and the introduction of certain provisions offers garbled references that may confuse the reader. For instance, as previously noted in the previous subsection,[252] the Anti-Money Laundering Authority ("*AMLA*") of the European Union is firstly addressed, excluding recitals, in Article 14, point 5, of the Proposal,[253] although it should have been addressed in Article 6, point 3, of the Proposal[254] as the relevant authority on the topic when addressing the content of Chapter IX of the Proposal. Second, having references to AML/CFT measures scattered around different provisions in the Proposal clashes with naming Chapter IX "*Anti-money laundering*", since a reasonable reader might expect all references to AML/CFT to be contained there, leading her to ignoring important considerations.

The European legislator should consider addressing this criticism and adopt changes in the structure of the Proposal to include all relevant references to AML/CFT measures in Chapter IX while providing references to said chapter where needed in the Proposal. A notable example in this Proposal concerns Article 38,[255] which is referenced up to four times[256] without being redundant.

6.7.2 Offline transactions only

Article 37, point 1, of the Proposal establishes that the paragraphs 2 to 6 of the Article are meant to be applied by PSPs only to offline digital euro payment transactions.[257] Consequently, all the AML/CFT measures described in the Proposal are only applicable to offline transactions, apparently leaving online digital euro payment transactions out. This asseveration finds its nuances in Article 34, point 1, letter e)[258] and Recital (80) of the Proposal,[259] as online digital euro payment transactions are subject to Directive (EU) 2015/849,[260] although the language used does not improve the readability of the

[252] See subsection 6.7.1 "*References to AML/CFT in Article 14(5) and 19(3) Proposal*" above.
[253] See *supra* note 245.
[254] See *supra* note 236.
[255] See Article 38 ("*Delegated acts*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[256] See Articles 11 ("*Additional exceptions of a monetary law nature*"), 34 ("Processing by payment service providers"), 35 ("*Processing of personal data by the European Central Bank and the national central banks*") and 36 ("*Processing by providers of support services*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[257] See *supra* note 227.
[258] See *supra* note 76, letter e).
[259] See Recital (80) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.
[260] See *supra* note 237.

provision. Consequently, an analysis on the reasoning behind the structure used in the Proposal is required, followed by a review of changes that the European legislator may consider clarifying its strategy when addressing AML/CFT measures that concern the digital euro.

The rationale for the content of Article 37, point 1, can be traced back to Article 34, point 1, letter (e), of the Proposal in connection with Recital (80).[261] [262] Online digital euro payment transactions are said to pose a greater AML/CFT risks because of its high liquidity, without the physical limitation of cash.[263] Consequently, online digital euro payment transactions are subject to the Money Laundering Directive[264] and the Funds Transfer Regulation,[265] which ensures a proper analysis of online digital euro payment transactions in line with the AML/CFT framework in force within the European Union.[266]

However, despite the asseveration on Recital (80), it could be argued that offline digital euro payment transactions are the most obvious path to money laundering because of the minimal amount of data that is processed. Pursuant to point 2 of Article 37, transaction data[267] shall not be retained by PSPs, or by the European Central Bank and the national central banks.[268] Thus, despite the existence of holding limits for the digital euro that may difficult money laundering and the financing of terrorism,[269] the lack of transaction control for offline digital euro payments may enable this kind of dishonest behaviour. Accordingly, the current strategy laid down in Article 37 does not seem to fully satisfy

[261] See *supra* note 259.
[262] See *supra* note 258.
[263] *Id*.
[264] See *supra* note 237.
[265] Regulation (EU) 2015/847 of the European Parliament and of the Council of 20 May 2015 on information accompanying transfers of funds and repealing Regulation (EC) No 1781/2006 (Funds Transfer Regulation.)
[266] The Proposal refers throughout the text to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing (COM/2021/420 final), which is meant to harmonise the AML/CFT strategy in a single source of primary law in the European Union. Since it is not yet in force, the reference to the other legal texts is required.
[267] See "*Transaction data*" in the *Glossary*. The lack of an explicit definition requires abstraction for its definition. The reader must consider that "*transaction data*" may not be personal data, consequently the analysis required goes beyond a privacy perspective. The European legislator is encouraged to define this concept to improve the analysis of the provision.
[268] See *supra* note 228.
[269] In particular, the specific holding limits considered for offline digital euro payment transactions pursuant to Article 37, point 6, of the Proposal. Additional holding limits minimise the possibility of incurring in money laundering and or financing of terrorism practices, as the considered amounts are small. The reader must consider that the nature of these limits is addressed in depth in subsection 6.7.4 "*Offline transaction and holding limits*" below.

the needs of both users and regulators.[270]

The sequence followed by the European legislator may be confusing for the reader. Beginning Chapter IX with a provision stating that its only article can only be of application to offline digital euro payment transactions may lead to believe that only those will be subject to the AML/CFT framework is not in line with affirming that online digital euro payment transactions pose "*greater AML/CFT*" risks is not adequate and sends a mixed message.

In addition to that, the strict application of Article 37 of the Proposal to offline digital euro payment transactions can also be target of criticism. Despite the benefits that arise from anonymity,[271] digital euro users can expect an offline manifestation of the digital euro that is less attractive than originally intended: they are less protected,[272] they experience higher holding limits[273] and their transactions are more controlled[274] than using the digital euro online counterpart. Considering the expectations of potential digital euro users,[275] the European legislator falls short in its attempt to please the citizens of the European Union. Since the Proposal is still being under review by relevant operators, changes and improvements could take place, although the European Central Bank has expressed its intention on keeping the current design for the offline digital euro,[276] despite the existence of alternatives that may be welcomed by every party involved.[277]

[270] As it stands, users demand more privacy for offline digital euro payment transactions, regulators have no concrete information on said offline transactions and the disincentive is currently affecting the transaction amount, as it is required by offline holding limits. The current design does not satisfy any of the parties involved and would benefit from a revision by the European legislator.

[271] See subsection 6.7.3 "*Offline transactions and their equivalence to an ATM withdrawal*" below. The minimal data processing that Article 37, point 3, of the Proposal establishes cannot be equated to anonymous transactions. Consequently, benefits coming from anonymity are marginal.

[272] See *supra* note 196. The general fraud detection and prevention mechanism is designed to protect online digital euro payment transactions exclusively.

[273] See subsection 6.7.4 "*Offline transaction and holding limits*" below.

[274] See subsection 6.7.3 "*Offline transactions and their equivalence to an ATM withdrawal*" below. Article 37, point 3, of the Proposal imposes PSPs the obligation to retain funding and defunding data in accordance with Article 40, point 1, letter (b) of the Money Laundering Directive (Directive (EU) 2015/849) that must be made available to the Financial Intelligence Unit described in Article 2, point 31, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing (COM/2021/420 final).

[275] See subsections 1.3.2 "*Initial concerns of the population*" in Chapter 1 and section 6.2 "*Privacy and digital payments*" in this Chapter. Potential digital euro users are worried about privacy and they were demanding anonymity and functionalities that would make the digital euro "*cash-like*."

[276] See point 13.1 of the 1 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). The European Central Banks welcomes the presented offline digital euro model that resembles cash in its current form. The rest of points included in section 13 ("*Online and offline use of the digital euro*") do not include amendments or expected changes in the offline digital euro model.

[277] See subsection 6.7.3.2 "*Alternative approach to anonymisation*" below.

6.7.3 Offline transactions and their equivalence to an ATM withdrawal

The Proposal had envisaged the equivalence of the offline digital euro to withdrawals of banknotes at automatic teller machines (ATM) in the Recitals[278] but this is only materialised in Article 37 of the Proposal. After establishing in its point 2 that transaction data shall not be retained by any of the relevant operators,[279] the Proposal determines in its point 3 that only funding and defunding data, for storing digital euros on payment instruments, shall be retained. Since only information on funding and defunding is retained, the offline manifestation of the digital euro is akin to a withdrawal from an automatic teller machine: the PSP in charge of the transaction is able to identify which user is withdrawing which amount of money, but it is later unable to identify the destiny of the withdrawn funds.[280]

In addition to that, Article 37, point 3, of the Proposal requires PSPs to retain data of funding and defunding in accordance with Article 40 of the Money Laundering Directive[281] and its national transpositions.[282] For its part, article 37, point 4, of the Proposal defines what constitutes "*funding and defunding data*."[283] While the first imposes the additional obligation to make the referred data available to the Financial Intelligence Unit,[284] as well as other competent authorities as referred in Article 2, point 31, of COM/2021/420 final,[285] the latter offers a revisited version of the content of Article 40 of the Money Laundering Directive.[286] While this structure might appear redundant, it contributes

[278] See Recitals (71) and (75) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[279] See *supra* note 228.

[280] The operation there described corresponds with a withdrawal, yet the opposite is also true for a deposit: the PSP in charge of the transaction is able to identify which user is depositing which amount of money and the destiny of the funds, yet it is unable to identify the source of said funds.

[281] See *supra* note 237.

[282] See *supra* note 229.

[283] See *supra* note 230.

[284] The Financial Intelligence Unit is never defined in Directive 2015/849 nor in COM/2021/420. It is just mentioned the same way it is in the Proposal. The European legislator is encouraged to provide a meaningful definition of the Financial Intelligence Unit to address its competences.

[285] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing (COM/2021/420 final).

[286] See Article 40, point 1, letter (b) of Directive (EU) 2015/849 of the European Parliament and of the Council of 20 May 2015 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, amending Regulation (EU) No 648/2012 of the European Parliament and of the Council, and repealing Directive 2005/60/EC of the European Parliament and of the Council and Commission Directive 2006/70/EC (Money Laundering Directive).

to clarify what data is expected to be processed, retained, and made available to the relevant authorities.[287]

Article 37, point 4, defines the content of the funding and defunding data meant to be retained.[288] In particular, funding and defunding data includes the amount funded or defunded,[289] the identifier of the local storage device for offline digital euro payment,[290] the date and hour of the funding and defunding transaction,[291] and the accounts numbers used for funding and defunding.[292] [293] This description matches the requirements of the Money Laundering Directive,[294] as stated above, and allows the authorities to identify the authority of any withdrawal or deposit of offline digital euro, but not its destiny or origin, since the settlement of offline digital euro transactions occur in the payment device. Consequently, data on transactions is not gathered, as it happens with cash payments, offering a final design that enables certain level of anonymity in payments made using the offline digital euro.

6.7.3.1 Critique – Is this *the best* possible alternative in terms of anonymity?

As it has been introduced before in this chapter,[295] the design choices made for privacy in the Proposal may not be the most appealing to the general public, as prospective digital euro users may consider the new digital manifestation of the single currency a minor improvement in terms of privacy over conventional means of payment provided by privately-owned payment service providers. In particular, as it has been addressed in this chapter, online digital euro payments provide an equivalent experience in terms of privacy to comparable means of payment,[296] and offline digital euro payment transactions may only be considered worse when it comes to privacy when compared to transactions using

[287] Pursuant to Article 40, point 1, letter (b) of Directive (EU) 2015/849 (Money Laundering Directive), a period of five years of retention is required for this type of information.
[288] See *supra* note 230.
[289] See *supra* note 230, letter a).
[290] See *supra* note 230, letter b).
[291] See *supra* note 230, letter c).
[292] See *supra* note 230, letter d).
[293] As it is defined, both funding and defunding operations require using digital euro holdings, since the reference in letter d) of Article 37, point 4, of the Proposal does not include the possibility to reference non-digital euro payment accounts or using cash services to that extent. This decision impact the expected anonymity associated with the offline digital euro, as funds withdrawn or deposit can be traced back to the digital euro payment account easily. Either way, the equivalence to an ATM withdrawal or deposit is guaranteed with the current design of the offline digital euro, which was the main objective.
[294] See *supra* note 286.
[295] See section 6.2 "*Privacy and digital payments*" above.
[296] See subsection 6.4.2 "*Data processed in online and in offline transactions*" above.

euro banknotes and coins.[297]

However, the privacy design chosen by the European Union for its digital euro is only one of many possible options. It is precisely the availability of alternative designs, powered by the existence of technology that enable these substitutes, which may generate a debate among potential users on whether to adopt the digital euro as a usual means of payment.[298] Consequently, the analysis of potential alternatives that may improve the current approach to privacy of the digital euro can be considered.

For instance, Project Tourbillon demonstrates cash-like anonymity for retail CBDC, employing a two-tier design that fits in the currently existing settlement infrastructures used for digital payment transactions.[299] This project, funded by the Swiss National Bank, tested the concept of payer anonymity, which provides cash-like anonymity to payers, although not for payees.[300] Thus, in this concept, a consumer paying a merchant does not disclose personal information to anyone, including the merchant, banks, or the central bank. However, the identity of the merchant is disclosed to the merchant's bank (as part of the payment) and is kept confidential there. While this concept increases the level of privacy, it also helps to reduce money laundering and the financing of terrorism, since the central bank is able to see the transaction amount but remains unaware of any details regarding the consumer or the merchant.

In the same fashion, Project Aurum 2.0 also improves privacy for retail CBDC payments by benefiting from the existing technological progress in digital payments and their

[297] See subsection 6.7.3 "*Offline transactions and their equivalence to an ATM withdrawal*" above.

[298] See *Digital Euro Has Germans Fretting Their Money Won't Be Secure*, Bloomberg. Available at: https://www.bloomberg.com/news/articles/2024-08-17/digital-euro-has-germans-fretting-their-money-won-t-be-secure?embedded-checkout=true. Published on August 17, 2024. Last accessed on September 20, 2024. German citizens were more worried about the issuance of the digital euro in 2023, after the publishing of the Proposal, than what they were in 2022. See also *Estudio sobre hábitos en el uso del efectivo*, Banco de España – Eurosistema. Available at: https://www.bde.es/f/webbe/INF/MenuVertical/BilletesYMonedas/Estudios_e_informes/Estudio_sobre_habitos_efectivo/Informe_Ejecutivo_Habitos_uso_efectivo_2023.pdf. Published on October 2023. Last accessed on September 20, 2024. 58% of surveyed Spanish citizens were reluctant to use the digital euro in 2022. In 2023, after the publishing of the Proposal, this percentage had grown to 65%. Privacy is listed as a concern of the population in both surveys.

[299] See BIS Innovation Hub (2023). *Project Tourbillon - Exploring privacy, security and scalability for CBDCs – Final Report*. Bank for International Settlements, ISBN 978-92-9259-711-5.

[300] See *Project Tourbillon demonstrates cash-like anonymity for retail CBDC*, Bank for International Settlements. Available at: https://www.bis.org/about/bisih/topics/cbdc/tourbillon.htm. Published on November 29, 2023. Last accessed on September 23, 2024.

settlement.[301] Based in the original Project Aurum,[302] in collaboration with the Hong Kong Monetary authority, the retail CBDC developed in the project uses, again, a two-tier design that guarantees compliance with know-your-customer (KYC) measures while implementing cryptography to implement a pseudonym system that presents the real identification only to the parties involved in the transaction and the relevant regulatory authority to prevent money laundering and the financing of terrorism.[303]

This brief analysis of alternative designs for a CBDC that increase the level of privacy for the users while ensure compliance with AML/CFT measures evidences the suboptimal choice made by the European Union authorities in the Proposal for the establishment of the digital euro. While the rationale for this design can be inferred from the content of the Proposal, several improvements could be included relying exclusively in the current legal framework that exists in the Union. Therefore, an alternative approach for both online and offline digital euro payment transactions is offered in the next subsection.

6.7.3.2 Alternative approach to anonymisation

Establishing an improved privacy framework for both online and offline digital euro payment transactions requires offering more confidentiality for digital euro users while ensuring that the AML/CFT measures considered in both the Anti-Money Laundering package[304] and this Proposal can be of application, effectively diminishing the unlawful behaviour of certain groups of the population. With this ambitious objective in mind, I present an alternative that benefits from already existing technology, envisions a more resilient landscape for digital payments in the future, and may provide higher satisfaction for prospective digital euro users who value their privacy.

Beginning with online digital euro payment transactions, because of the minimal changes that this proposal entails over its current design, pseudo-anonymisation functions as the key element to elevate the level of privacy offered to digital euro users. Following

[301] See *Project Aurum 2.0: Improving privacy for retail CBDC payment*, Bank for International Settlements. Available at: https://www.bis.org/about/bisih/topics/cbdc/tourbillon.htm. Published on March 6, 2024. Last accessed on September 23, 2024.

[302] See BIS Innovation Hub (2022). *Project Aurum – A prototype for Two-tier Central Bank Digital Currency*. Bank for International Settlements.

[303] ee section 2.3 ("*Privacy*") of BIS Innovation Hub (2022). *Project Aurum – A prototype for Two-tier Central Bank Digital Currency*. Bank for International Settlements.

[304] See *Anti-money laundering and countering the financing of terrorism at EU level*, European Commission. Available at: https://finance.ec.europa.eu/financial-crime/anti-money-laundering-and-countering-financing-terrorism-eu-level_en. Last accessed on October 28, 2024.

the standards laid down by the European Union concerning the establishment of a framework for a unified European Digital Identity,[305] an immutable user identifier could be implemented for each citizen adopting this unified digital certificate. Said user identifier is required to be secret and efforts from both public authorities and the users themselves[306] are needed to safeguard it. However, under this alternative, the pseudo-anonymisation can be reversed under duly justified circumstances. Thus, whenever an online digital euro payment transaction is initiated, the following data is processed:

- Payer and payee have access to personal data of the other party, effectively addressing who they are interacting with.
- The PSP, or PSPs, involved in the transaction only process the information pursuant to the content of Article 34 of the Proposal, and its Annex III, although they are only entitled to process the immutable user identifier described in the previous paragraph, which effectively prevents PSPs from identifying individuals.
- The European Central Bank, and the national central banks where needed, as well as the providers of support services, maintain the same rights to process personal data as described in Articles 35 and 36 of the Proposal, and its Annexes IV and V.
- However, should the relevant authorities in the fight against money laundering and the financing of terrorism suspect of any given individual, in the context of a duly-founded inquiry, performed either by the Office of the Prosecutor or by authorised administrative offices,[307] a court may authorise the revelation of the pseudo-anonymous user identifier associated to that user, as well as others involved in the affected payment transactions, under the principle of proportionality and only for the purposes described in this bullet point.

Following this alternative design, online digital euro payment transactions provide a slightly higher level of privacy for consumers, as PSPs no longer can process their identity directly, and the pseudo-anonymisation can only be undone whenever the judiciary allows

[305] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) No 910/2014 as regards establishing a framework for a European Digital Identity. COM(2021) 281 final.

[306] See Raya-Quero, D. (2020). La diligencia de los usuarios y el papel de la biometría en la Directiva (UE) 2015/2366. *Diario La Ley*, (9742). PSD2 requires the diligent action of the owner of the means of payment to prevent others from accessing its secret code.

[307] E.g., tax inspectors dependent on the government of a Member State.

it, effectively guaranteeing the interests of *bona fide* digital euro users. To ensure that PSPs comply with this change, the online holding limits considered for the digital euro must be kept under reasonable terms, and this alternative must be employed for transactions that exclusively involve the digital euro. Thus, should the waterfall and reverse-waterfall functions described in Article 13, point 4, of the Proposal[308] apply to a transaction, the proposed pseudo-anonymisation would not apply, allowing the PSPs involved to identify the parties involved in the transaction as described in Article 34 of the Proposal.[309]

Concerning offline digital euro payment transactions, the implementation of a similar design considering pseudo-anonymisation, as previously introduced for online transactions, requires additional changes, yet ensures the viability of, mostly, the currently applicable legal framework. Thus, by disposing of the current privacy design for offline digital euro payment transactions, equating them to an ATM operation, it is possible to provide a safer system that allows the authorities to fight against money laundering and the financing of terrorism while providing an equivalent level of privacy to the digital euro users. In this fashion, whenever an online digital euro payment transaction is initiated, the following data is processed:

- Funding or defunding of offline digital euro holdings would require PSPs to process data as described in Article 34 of the Proposal, albeit they would only be authorised to process the user identifier that effectively prevents them from identifying individuals. The European Central Bank, and the national central banks where needed, as well as the providers of support services, will not process any data for the funding and defunding of offline digital euro holdings.

- Once a transaction in proximity to be settled offline is to take place, both payer and payee will have access to personal data concerning the other party, effectively identifying them before the transaction is performed. This information will remain, encrypted, in the local storage devices of both payer and payee.

- After the transaction, once any of the parties accesses the digital euro services online,

[308] See Article 13, point 4, of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[309] Consequently, this alternative may provide a new class of digital euro payment transactions: low value online digital euro payment transactions. Considering the content of Article 23, point 3, of the Proposal, the European legislator has already considered differentiating digital euro payment transactions solely on the amount involved. Therefore, enabling a similar concept for online transactions exclusively should not entail any operational issue.

the encrypted data on the transaction will be uploaded to a secure database owned by the European Central Bank, where it will remain, encrypted and duly guarded, for a timeframe yet to be determined.[310] Only the monetary authority of the euro area must have access to the decryption key.[311]

- Similarly to what has been described for online digital euro payment transactions, should the relevant authorities in the fight against money laundering and the financing of terrorism suspect of any given individual, as well as general fraud scenarios, in the context of a duly-founded inquiry, performed either by the Office of the Prosecutor or by authorised administrative offices,[312] a court may authorise the decryption of the transaction data to identify both parties. This authorisation may only be provided under the principle of proportionality and only for the purposes described in this bullet point.

Following this alternative design, offline digital euro payment transactions improve both the level of safety and privacy for consumers, while ensuring adequate prosecution of unlawful behaviour enabled by digital euro payment transactions. Considering that the offline holding limits that the European Union authorities are considering may be substantially low,[313] the encrypted data for most transactions would never face a decryption process. However, this alternative design enables the authorities to pursue unlawful behaviour thanks to transaction information, contrary to the current design for offline digital euro payment transactions, in which no data is processed after the funding or defunding of offline holding limits, effectively preventing an adequate enquiry when needed despite not providing additional privacy to digital euro users when compared to this design.

[310] The optimal design of this system required analysing how long should this data be guarded by the European Union authorities before being deleted.

[311] See, e.g., *Encrypting and decrypting data with an asymmetric key*, Google Cloud. Available at: https://cloud.google.com/kms/docs/encrypt-decrypt-rsa. Last accessed on September 23, 2024. Asymmetric encryption provides a safe approach to the process described here. While information is encrypted in the mobile device of the digital euro user, it can only be decrypted using the decryption key, which is in possession of the European Central Bank.

[312] See *supra* note 307.

[313] Nowhere in the Proposal is established the amount that will be imposed as an offline holding limit, yet it is sensible to believe that these will be reasonably low to prevent undesired competition with commercial banks, as discussed previously in See subsection 3.2.3.1 "*The necessity for limits - Recitals (2), (3), (24), (37), (49) and Article 16(1) Proposal*" in Chapter 3 of the Thesis.

6.7.4 Offline transaction and holding limits

As expressly mentioned before in the Proposal,[314] offline digital euro payment transactions may be limited to a greater extent than online digital euro payment transactions. Article 37, point 5, of the Proposal[315] establishes that the European Commission is empowered to adopt implementing acts setting offline digital euro payment transaction limits and holding limits, in accordance with the examination procedure referred to in Article 39 of the Proposal.[316] [317] While holding limits have already been addressed in detail before, transaction limits are mentioned in this Article for the first time, requiring an additional analysis.

After reviewing the Proposal, transaction limits are only referenced in Recitals (82) and (83) outside of Article 37,[318] yet neither provide an adequate definition of what they entail. However, these transaction limits can be inferred from another recital that considers the introduction of limits on the digital euro's use as a store of value. Specifically, Recital (32) refers to policy tools that could be used for that purpose, namely quantitative limits to individual digital euro holdings and limits to conversion of other categories of funds to digital euro in a specified timeframe.[319] Considering the nature of the limitations considered, it could be argued that transaction limits are meant to follow that rationale, although other questions may arise. The subject area of these limits is not defined and inferring from other considerations in the Proposal might not be enough. For instance, Article 14, point 5, of the Proposal seems to suggest that these limitations may arise in accordance with personal characteristics of the parties involved

[314] Article 16, point 4, of the Proposal introduced the concept of specific holding limits for offline digital euro payment transactions. See subsection 3.2.3.2.2.1 "*Online vs. Offline limits - Article 16(4) Proposal*" in Chapter 3 of the Thesis.

[315] See *supra* note 231.

[316] See Article 39 ("*Committee procedure*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. This Article enables the adoption of implementing acts, following the examination procedure pursuant to Article 5 of Regulation (EU) No 182/2011 of the European Parliament and of the Council of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by Member States of the Commission's exercise of implementing powers.

[317] The reader must acknowledge that this provision in the Proposal references implementing acts, and not delegated acts.

[318] See Recitals (82) and (83) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. While the first one only reference transaction limits as "*essential to mitigate AML/CFT risks*" in offline digital euro payment transactions, the latter solely references them in order to address the implementing powers that should be conferred on the European Commission pursuant to Article 39 of the Proposal.

[319] See Recital (32) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

in the transaction,[320] which would be sensible in light of Recital (32), despite looking overly specific.[321] However, the "*placement*" of such limitation in the Proposal,[322] the use of a different naming convention,[323] and the lack of a direct reference or definition in Article 37 creates a difficulty where it should be none.[324]

6.7.4.1 Rationale for transaction and holding limits

The rationale for restricting the use of the offline digital euro as a means of payment can be found in Article 37, point 6, of the Proposal.[325] However, considering the growing tension between the legal tender status of the digital euro[326] and the problems that may arise with a non-supervised offline digital euro, the European Commission shall take into account several considerations when drawing up the implementing acts that will enable the limitations, as the Article determines.

Thus, Article 37 requires the European Commission to take into account an assessment of the money laundering and terrorist financing threats, vulnerabilities and risks of the digital euro when funding and defunding their payment instrument,[327] any relevant recommendations and reports drawn up by international organisations and standard setters with competence in the field of preventing money laundering and combating terrorist financing,[328] as well as the objective of ensuring the usability and acceptance of the digital euro as a legal tender instrument.[329]

Finally, according to the closing paragraph of Article 37, point 6, of the Proposal,[330] the Commission may request the Anti-Money Laundering Authority of the Union (AMLA) to adopt an opinion assessing the level of money laundering and terrorist financing threats

[320] See *supra* note 245.
[321] Article 14, point 5, of the Proposal is referring to a particular set of vulnerable groups in search of financial inclusion. Therefore, the apparent gap that exists in Article 37 as a result of a lack of definition of the concept cannot be integrated with a partial consideration of a casuistry associated with the phenomenon.
[322] See subsection 6.7.1.1 "*Critique – AML should have been addressed altogether*" above.
[323] Article 14, point 5, of the Proposal does not address "*limitations*." It can be inferred that limitations may arise from this article, but not the other way around.
[324] The absence of a proper definition, in connection to the abstraction needed to infer the nature of said limitations, recommends the European legislator a revision of Article 37, or including the aforementioned definition in Article 2 of the Proposal.
[325] See *supra* note 233.
[326] See subsection 3.3.2 "*Tension: mandatory acceptance vs. free use by the citizenry*" in Chapter 3 of the Thesis. The tension between mandatory acceptance, digital euro users' preferences and the objectives of the Proposal are difficult to align.
[327] See *supra* note 233, letter a).
[328] See *supra* note 233, letter b).
[329] See *supra* note 233, letter c).
[330] See *supra* note 233.

associated with the offline digital euro and its vulnerabilities.[331] While the content of this provision is useful for the goal at which Chapter IX is aimed at, AMLA is not yet an official authority in the European Union because it is to be established once COM/2021/421 final[332] is implemented. Therefore, the effect of this provision is diminished and rendered futile in the meantime.

[331] For the purposes of letter a) of Article 37, point 6, the European Commission may consult the European Data Protection Board for this purpose.

[332] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Authority for Anti-Money Laundering and Countering the Financing of Terrorism and amending Regulations (EU) No 1093/2010, (EU) 1094/2010, (EU) 1095/2010. COM/2021/421 final.

Chapter 7

Conclusions

For the past six chapters, the Proposal for the establishment of the digital euro[1] has been analysed thoroughly, in an attempt to identify the most relevant design choices made by the European Union's authorities when determining the characteristics of the new digital manifestation of the single currency. The main goal of this study, as described in Chapter 1 of the Thesis,[2] it has been to adequately provide a review of the legal structure of the upcoming digital euro, focusing on those aspects that arise the most doctrinal complexity for both the legal academia and the European legislator. To achieve said goal, this study has provided academic context that justify the current design of the Proposal, provision by provision, employing a methodology focused on providing a holistic and comprehensive perspective of the proposed legal structure for the upcoming digital euro. Thus, the aim of this study has been to gather the existing legal, economic, and technical knowledge in the topic of central bank digital currencies (CBDC) in general, and the digital euro in particular, to create a referential work for other researchers to build upon, expanding the analysis.

The legal analysis performed in this Thesis has contributed to determine whether the expectations of the relevant stakeholders of the digital euro has been met. While relevant actors in the digital payments landscape, such as payment service providers (PSPs), have found their requests materialised in the text of the Proposal,[3] prospected

[1] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final. Hereinafter in the chapter, "*the Proposal*."

[2] See section 1.4 "*Goal of this thesis*" in Chapter 1 of the Thesis.

[3] With the exception of card scheme owners, most relevant actors in the digital payments landscape, namely credit institutions, have collaborated with the European Union's authorities to determine the final design of the digital euro, contributing to the inclusion in the Proposal of characteristics that prevent the new digital manifestation of the single currency from superseding privately-owned means of payment,

digital euro users have acknowledged that some of their concerns have not been handled with care, enabling a debate on whether the digital euro is the public digital means of payment that the citizens of the euro zone need and deserve.[4] Consequently, several changes are still expected in the final text of the Proposal, before being ratified by the legislative procedure of the European Union. While not all these changes find its roots in the desires of the population of the European Union,[5] the analysis performed in Chapter 2 of this Thesis[6] encourages the European legislator to understand the needs of the citizenry before imposing a means of payment that does not meet their expectations in terms of usability or transaction privacy.

In addition to that, this study has contributed to identify essential characteristics of the upcoming digital euro by exploring its prospected consequences into users' adoption, and likely conflicts that may appear in the future, as the Proposal stands right now. Thus, the analysis performed in each of the previous six chapters has been designed to contribute to the detection of flaws in the provisions of the Proposal, encouraging the European legislator to amend the text where additional clarification is needed or the content of the provision may bring undesired consequences once it is final. Such analysis has been founded on prior relevant literature from the European legal academia, as the topic surrounding the issuance of a digital euro has drawn the attention of international scholars. However, because of the holistic nature of the present work and the methodology of analysis employed, not every detail included in the Proposal has been addressed thoroughly, and a future, deeper, analysis is encouraged to adequately determine the consequences of the design of the digital euro as currently drafted. Thus, future lines of research, with some of them already being drafted by the research team of which this novice author is a member, are identified to contribute to this direction, in an attempt to ensure the flawless implementation of a digital euro that meets every stakeholder's requirements with a design that is backed up by academic research.

Considering the above, this final chapter is structured as follows: first, a description of what is, and what is not in its current form, the digital euro is offered, determining

while ensuring competence.

[4] See subsection 1.3.2 "*Initial concerns of the population*" in Chapter 1 of the Thesis.

[5] See the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). The European Central Bank has endorsed some of the design choices made by the European legislator, yet it has also criticised some other characteristics, recommending its immediate amendment.

[6] See Chapter 2 ("*The legal tender status of the digital euro*") of the Thesis.

whether the prior expectations of all relevant actors in the digital payments landscape, namely PSPs and prospected digital euro users, have been adequately met. Second, a catalogue of expected changes in the text of the Proposal is offered, determining what will be improved in the final version of the upcoming Regulation for the establishment of the digital euro. Third, a description of the key features of the digital euro as analysed in this Thesis is offered, following the structure of chapters presented, which mimics somehow the structure of the Proposal. Finally, the limitations of the present study are listed, with future lines of research based on those being offered.

7.1 Expectations on the prospected issuance of the digital euro

Ever since the initial approach on the creation and issuance of the digital euro were addressed in October 2020 by the European Central Bank,[7] the design of the European Union's CBDC has seen its characteristics change over time. As previously addressed in Chapter 1 of the Thesis,[8] the digital euro was originally envisioned to complement the role of central bank money in its physical form, enabling the population to access digital payments with a public alternative not subject ot the interests of private parties.[9] Thus, the digital euro was guaranteed to introduce several advantages in the digital payments system, promoting financial inclusion for the unbanked population, as well as accessibility features for those in need of digital inclusion, and supporting the European Central Bank's monetary policy transmission. All this while considering user needs and preferences, such as ease of use and accessibility with interoperability being essential, privacy and data protection, introducing the tension between traceability and the desire for anonymisation, as well as security in the transactions.[10] Thus, these preferences, which were ratified by the citizens of the European Union in 2021,[11] were to become

[7] See *Report on a digital euro*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf. Published in October 2020. Last accessed on September 16, 2024.

[8] See subsection 1.3.1 "*Early conceptualisation*" in Chapter 1 of the Thesis.

[9] *Id*.

[10] See *supra* note 7.

[11] See *Eurosystem report on the public consultation on a digital euro*, European Central Bank – Eurosystem. Available at: https://www.ecb.europa.eu/pub/pdf/other/Eurosystem_report_on_the_public_consultation_on_a_digital_euro~539fa8cd8d.en.pdf. Published in April 2021. Last accessed on September 20, 2024.

the foundational characteristics of the digital euro, yet the final design included in the Proposal may not be completely aligned with those, in particular when it comes to privacy in payment transactions.

One of the contributions of this work has been the adequate identification of what is the digital euro as described in the 42 articles of the Proposal, in contrast to what the European Union's authorities had previously described in non-binding documentation.[12] Thus, the next sub-section contributes to clarify what prospective digital euro users may reasonably anticipate for the issuance of the CBDC.

7.1.1 What is the proposed digital euro and what is not?

As previously described in Chapter 1 of the Thesis, the digital euro has been designed to work as a hybrid, account-based, retail CBDC that runs in a conventional settlement infrastructure based in TARGET Instant Payment Settlement (TIPS) technology.[13] The choices made by the European legislator to this extent have been meticulously defined by the main objective set out with the implementation of the digital euro, which is enabling its use to a wide sector of the population within the European Union.[14] [15] Thus, the digital euro will be a public means of payment meant to enable citizens within the euro zone to access a digital manifestation of central bank money for both online and offline payment transactions. In addition to that, the Proposal has established several characteristics concerning its accessibility and use, ensuring that any prospective user within the territorial scope of the Proposal,[16] will be entitled to conduct payment transactions using her digital euro payment account with ease. Finally, the European legislator has ensured that the digital euro safeguards its users' privacy better than alternative digital means of payment arising from privately-owned actors,[17] while providing the authorities and the

[12] See section 1.3 "*The digital euro*" in Chapter 1 of the Thesis for a chronological description on this topic.

[13] See subsection 1.3.4.1 "*Why a digital euro in the form described in the Proposal*" in Chapter 1 of the Thesis.

[14] See subsection 3.2.2 "*Principles that govern the use of the digital euro as a store of value - Article 15 Proposal˝* in Chapter 3 of the Thesis.

[15] While the first issuance of the digital euro would only include the Member States whose currency is the euro, the content of Chapter 4 of the Thesis supports the idea that the rest of the Member States of the European Union would be able to benefit from the distribution of the digital euro later, in a short period of time.

[16] See section 2.4 "*Limitations to the principle of mandatory acceptance*" in Chapter 2 of the Thesis.

[17] See sections 6.4 "*Data processing by PSPs – Article 34 Proposal*", 6.5 "*Processing by the ECB and national central banks – Article 35 Proposal*", and 6.6 "*Processing by providers of support services – Article 36 Proposal*" in Chapter 6 of the Thesis.

judiciary with sufficient information to prevent money-laundering and the financing of terrorism.[18] In all, the digital euro has been designed to offer a better means of payment to the population of the European Union by providing marginal[19] improvements over the existing technology available for digital payments.

However, determining what the digital euro is not, according to the provisions of the Proposal, might be more revealing for its analysis, since it provides relevant context on the extent of the technological progress that will be made with its implementation. Thus, the digital euro cannot be equated to any form of crypto-asset running in a DLT-based settlement infrastructure,[20] it is not equivalent to a public bank account[21] nor an interest-bearing financial instrument,[22] it cannot act as programmable money,[23] and barely improves the level of privacy provided by privately-owned equivalent means of payment.[24] Ultimately, the digital euro is neither an unseen manifestation of technology nor a ground-breaking revolution for the financial system, despite the potential held by CBDCs in this regard.

It is difficult not to overlook the idea that the implementation of the digital euro, as designed under the Proposal, is a missed opportunity to improve the position of consumers in the European Union and to promote fairer financial services intermediation. While it is sensible to understand that the implementation of a digital euro that includes some of the characteristics described in the previous paragraph would end up causing an undesired competition with commercial banks that might end up jeopardising the financial system as a whole,[25] the resulting instrument is not guaranteed to be successful despite being

[18] See section 6.7 "*Anti-Money Laundering – Chapter IX – Article 37 Proposal*" in Chapter 6 of the Thesis.

[19] See subsection 1.2.2.5 "*A note on emerging technologies and CBDC*" in Chapter 1 of the Thesis. More advanced technology was already available for the implementation of the digital euro, yet the European Union's authorities have decided to stick with minor, marginal, improvements over the already existing technology in an attempt to bring the benefits of central bank money to digital payments while not disrupting the financial system within the European Union.

[20] See subsection 1.2.2.2 "*Conventional or DLT infrastructure*" in Chapter 1 of the Thesis.

[21] See subsection 4.3.2 "*Overlapping between this Proposal and Directive (EU) 2014/92 – Article 14(2)*" in Chapter 4 of the Thesis.

[22] See subsection 3.2.3.3 "*The digital euro shall not bear interest – Article 16(8) Proposal*" in Chapter 3 of the Thesis.

[23] See subsection 5.2.4 "*Conditional digital euro transactions vs. Programmable money – Article 24 Proposal*" in Chapter 5 of the Thesis.

[24] See subsection 6.7.3.1 "*Critique – Is this the best possible alternative in terms of anonymity?*" in Chapter 6 of the Thesis.

[25] A digital euro capable of replacing classical financial intermediation services would cause users to have no real incentive to use them, resulting in an absolute monopoly position in favour of the European Union's authorities. The functions of the European Central Bank are not those of commercial banking. This would be impractical, as described in subsection 1.2.2.1 "*The nature of claims of CBDC and the central bank role*" in Chapter 1 of the Thesis and would discourage commercial banks from providing said services.

required for nowadays consumer's payment habits. The European legislator is encouraged to review the scope of the Proposal to determine whether it is recommended to proceed with the implementation of the digital euro as it is currently designed, considering the risk of issuing the new digital manifestation of the single currency just to see how it is overlooked by the population of the European Union.

7.2 Prospected changes in the Proposal before the definitive Regulation is published

The thorough review of the Proposal made in the Thesis has made possible to identify most relevant changes that are expected to its provisions in the definitive version of the text. While some of these prospected changes find its rationale in mere printing mistakes or references to prior, unseen, versions of the Proposal, others are based on legal considerations brought by the European Central Bank or the legal academia. This section enumerates these changes and references its motivation, as previously addressed in the previous six chapters of the Thesis.

7.2.1 Changes in Chapter III ("*Legal Tender*")

As seen in Chapter 2 of the Thesis,[26] the European legislator is encouraged to consider a minor amendment in Article 9 of the Proposal.[27] From a structural perspective, there is no justification for the placement of the final provision of Article 9, since it only affects letter b) to that article,[28] as expressly determined. Therefore, it could have been included following the last sentence in said letter, improving the readability of the provision. Similarly, letter c) to Article 9 of the Proposal includes a reference to "*personal or household activities*."[29] As previously addressed,[30] despite being addressed in Recital (18) of the Proposal,[31] these activities are not described anywhere in the text. Because of its implications, the

[26] See note 113 in Chapter 2 of the Thesis.

[27] See Article 9 ("*Exceptions to the obligation to accept the digital euro*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[28] See *Id.*, letter b)

[29] See *Id.*, letter c)

[30] See note 119 in Chapter 2 of the Thesis.

[31] See Recital (18) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

European legislator is encouraged to provide a definition in the definitive version of the Proposal.

In terms of missing definitions, Article 11 of the Proposal[32] might also benefit from the inclusion of another. The "*exceptions of monetary law nature*" included in said provision, despite being addressed briefly in Recital (19),[33] are not described anywhere in the Proposal, leading to the impossibility to understand in advance under which circumstances would be possible to introduce new exceptions to the principle of mandatory acceptance of the digital euro.[34]

7.2.2 Changes in Chapter IV ("*Distribution*")

The prospected changes identified for Chapter IV of the Proposal concern the inclusion of proper definitions for several concepts that are referenced in the text, yet they lack an adequate definition that ensures the categorisation of their implications. Thus, while the Proposal adequately defines "*merchant service charge*", there is no definition for "*inter-PSP fee*", despite being addressed together in the Proposal.[35] For clarity purposes, the European legislator is encouraged to consider including a definition for the latter too.[36]

For its part, the European legislator is required to ensure clarity when addressing the topics of digital and financial inclusion, since both concepts are addressed together in the text, being referenced indistinctly by mistake.[37] Since both concepts reference different undesired scenarios,[38] offering separate definitions could improve the ability of the reader to address them accordingly. In addition to that, the European legislator is also encouraged to properly unify three different categories also listed in the text.[39] In an attempt to unify concepts, up to three different categories are listed: "*unbanked*", "*underbanked*" and "*offline*" population in Recital (5) of the Proposal. While the first two clearly refer to the same reality, "*offline population*" does not only refer to a sector of

[32] See Article 11 ("*Exceptions to the obligation to accept the digital euro*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[33] See Recital (19) of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[34] See note 138 in Chapter 2 of the Thesis.

[35] See note 104 in Chapter 4 of the Thesis.

[36] *Id*.

[37] See note 172 in Chapter 4 of the Thesis.

[38] See subsection 5.3.9.1 "*Critique – The technological progress paradox*" in Chapter 5 of the Thesis.

[39] See note 174 in Chapter 4 of the Thesis.

the population unable to access financial intermediation, but a sector of the population who struggle with technology. Therefore, the first two categories belong in the financial inclusion, with the third one referencing digital inclusion.

7.2.3 Changes in Chapter V ("*Use of the digital euro as a store of value and as a means of payment*")

Chapter V of the Proposal includes the most prospected changes because of the nature of its provisions, addressing the use of the digital euro as a store of value and as a means of payment, which have been drastically regulated to prevent an undesired competition with commercial banks. Consequently, the nature of these prospected changes goes beyond the absence of definitions, as it is the case in other Chapters, and focuses on specific amendments in the text of the Proposal concerning the implementation of holding limits for digital euro payment accounts.

Thus, the content of Article 16 of the Proposal[40] is contended for several reasons. First, the text in the Proposal suggests that the establishment of limits on the digital euro is an optional feature, yet the European Central Bank is required to develop instruments to limit the use of the digital euro as a store of value, something the monetary authority has criticised as it seems to be incompatible.[41] Second, the naming convention used by the European Commission in the Proposal for each of the limits considered in this provision can be deemed as confusing, especially when no definitions are provided for each of the categories.[42] And, third, the consideration on imposing the same holding limits in each Member State may difficult the distribution of the digital euro and its acceptance and effective use throughout the entire euro zone, since a common holding limit may have different implications for the population of each Member State.[43]

Considering the specific nature of offline digital euro holding limits, the Proposal does not address whether it is possible to hold offline digital euro in different devices

[40] See Article 16 ("*Limits to the use of the digital euro as a store of value*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[41] See note 41 in Chapter 3 of the Thesis.

[42] See note 63 in Chapter 3 of the Thesis.

[43] See notes 60 and 80 in Chapter 3 of the Thesis. For instance, considering a hypothetical 3000€ holding limit may have different implications for the population of Germany and Greece. While the rationale can be adequately justified, the European legislator is encouraged to review its strategy for the implementation.

owned by the user.[44] Since it may be possible, the Proposal should address the possibility, or reject it altogether, in order to determine the effects in the settlement of digital euro payment transactions and security, as it may become impractical for digital euro users with limited internet access that share a digital euro payment account.[45] The European legislator is encouraged to conduct an in-depth analysis of special cases of use such as this to ensure the final design of the digital euro does not neglect specific sectors of the population. Similarly, the current definition of holding limits when considering multiple accounts owned by a digital euro user, or a digital euro payment account owned by multiple users,[46] may enable undesired exploitations by prospective digital euro users, as described in Chapter 3 of the Thesis.[47]

Concerning the use of the digital euro as a means of payment, despite the explicit inclusion of basic digital euro payment services, which are meant to be free for natural persons,[48] the text of the Proposal does not guarantee that essential features such as automated funding and defunding functionalities can be provided for free, which may discourage the adoption of the digital euro.[49] The European legislator has been required by the European Central Bank to review this and update the text of the Proposal in this sense.[50]

In addition to that, the European Central Bank has drawn the attention of the European legislator to two more inclusions in the Proposal. First, despite being required by the Proposal to determine the maximum amount for merchant charges and inter-PSP fees,[51] the European Central Bank has pointed out that it lacks the proper authority to do so.[52] Thus, should the monetary authority publish said amounts, it cannot be considered *de jure* determination. Should any affected party challenge and subject them to judicial scrutiny, an action for annulment could be granted, jeopardising the objectives associated to that publication.[53] Second, the European Central Bank has encouraged the European

[44] See note 97 in Chapter 3 of the Thesis.
[45] *Id*.
[46] See subsection 3.2.3.2.2.3 "*Limits on multiple accounts / An account owned by multiple people - Articles 16(6) and 16(7) Proposal*" in Chapter 3 of the Thesis.
[47] See note 100 in Chapter 3 of the Thesis.
[48] See subsection 3.3.3 "*Free for natural persons on basic digital euro payment services - Article 17(1) and Annex II Proposal*" in Chapter 3 of the Thesis.
[49] See note 158 in Chapter 3 of the Thesis.
[50] *Id*.
[51] See note 178 in Chapter 3 of the Thesis.
[52] See note 226 in Chapter 3 of the Thesis.
[53] *Id*.

legislator to determine what is "*a representative group*" of PSPs, as requested in Article 17 of the Proposal.[54] Both circumstances recommend the European legislator performing changes in the text of the Proposal to address the difficulties pointed out by the monetary authority.

7.2.4 Changes in Chapter VI ("*Distribution of the digital euro outside the euro area*")

Concerning Chapter VI of the Proposal, the prospected changes include improvements on the structure of Articles 19 and 21 to allow for an easier comprehension of the content of said provisions. Thus, as previously identified in Chapter 4 of the Thesis,[55] the structure chosen by the European legislator for Article 19, and in particular for its points 3 and 4, might be confusing for the reader. Despite it could be argued that the reader can still infer the consequences when reading altogether both point 3 and 4, it is rather unlikely that the European Union would sign an agreement with a third country that is already identified as problematic in terms of AML/CFT measures, so a reformulation is encouraged.[56] [57]

For its part, the content of Article 21 of the Proposal requires at least two amendments. First, as noted in the analysis of said provision in Chapter 4 of the Thesis,[58] the Proposal enables the possibility of allowing cross-currency payments between the digital euro and other currencies should they be subject to a prior agreement between the European Central Bank and the national central banks of the Member States whose currency is not the euro "*and*" the third countries. The language of the provision uses "*and*" instead of "*or*." While the message is still clear, the use of a disjunctive conjunction is encouraged to avoid any confusion to the reader,[59] hence the recommendation towards the European legislator. In addition to that, the absence of a definition for cross-currency payments presents difficulties for the reader, since they do not refer to the same circumstances as

[54] See note 220 in Chapter 3 of the Thesis.

[55] See subsection 4.4.2.2 "*AML/CFT considerations – Article 19(3) and (4) Proposal*" in Chapter 4 of the Thesis.

[56] See *Id*.

[57] See also note 239 in Chapter 4 of the Thesis. As it stands right now, the consideration in Article 19, point 3, of the Proposal suits the scenario in which the European Union and a third country sign an agreement and, later, said country falls under one of the categories described in Articles 23 and 24 of the Proposal for an Anti-Money Laundering Regulation, which would probably cause the agreement to be terminated.

[58] See subsection 4.5.1 "*Cross-currency payments in the Proposal*" in Chapter 4 of the Thesis.

[59] See note 266 in Chapter 4 of the Thesis.

cross-border payments do, for which definitions have been provided in other sources of law in the European Union. While the concept is not new in itself,[60] a proper definition would ensure future alignment when the topic is addressed after the first issuance of the digital euro.

7.2.5 Changes in Chapter VII ("*Technical features*")

The prospected changes in Chapter VII of the Proposal mostly concern the lack of needed definitions or the absence of a technical feature of the digital euro being addressed in one of the provisions. However, the first requirement for the European legislator also concerns Chapter II of the Proposal, as Article 27 explicitly references the Second Payment Services Directive (PSD2) despite the fact that Article 5 includes its upcoming substitute, the Third Payment Services Directive.[61] [62] The European legislator is encouraged to align the references to avoid complexity for the reader, since the applicable law must be addressed uniformly throughout the text.

An adequate definition for "*front-end services*" is still required in the Proposal.[63] Despite providing a definition for front-end services, the Proposal does not adequately clarity what is being regulated in Article 28 of the Proposal.[64] While the concept may be approximated to the user interface that enables users to access all digital euro services as described in Annex I of the Proposal, the current definition does not satisfy neither a technical operator nor a standard user of the digital euro, hence a revision might be encouraged, because, as it is written at this moment, it fails to represent what is meant to regulate.[65] In addition to that, the European legislator is also encouraged to review the content of Article 28 of the Proposal, since PSPs that may use proprietary front-end services may end up tricking users into thinking they require a non-digital euro account to user waterfall functionalities, despite not being the case according to the Proposal.[66]

[60] See note 271 in Chapter 4 of the Thesis.
[61] Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on payment services and electronic money services in the Internal Market amending Directive 98/26/EC and repealing Directives 2015/2366/EU and 2009/110/EC (Third Payment Services Directive or PSD3.)
[62] See note 139 in Chapter 5 of the Thesis.
[63] See subsection 5.3.4 "*Front-end services to access and use the digital euro – Article 28 Proposal*" in Chapter 5 of the Thesis.
[64] *Id*.
[65] See note 164 in Chapter 5 of the Thesis.
[66] See note 174 in Chapter 5 of the Thesis.

Finally, it could be argued that the placement of Article 29 of the Proposal[67] is not optimal, since it concerns a topic that is barely technical.[68] While it is true that the provision concerns a technical verification of limitations that PSPs must perform with digital euro users, this provision is more linked to the topic of the distribution of the digital euro and the application of holding limits, which may recommend its placement elsewhere in the Proposal.[69]

7.2.6 Changes in Chapter VIII ("*Privacy and data protection*")

Concerning Chapter VIII of the Proposal, only one additional definition is required, as the concept of "*single access point*" referenced in Article 35, point 6, of the Proposal is not expanded anywhere in the main text of the Proposal, nor in the Annexes.[70] Since this is a technical concept that enables certain safeguarding characteristics of the digital euro, it is necessary to understand what does it entail and which technology would be used for it.

In addition to the missing definition, two additional concepts require further context because of its implications in the issuance of the digital euro. First, the counterfeit analysis of offline digital euro payment transactions is not addressed anywhere in the Proposal, yet the European legislator makes explicit its concerns in Annex IV, evidencing that its analysis has been taken into consideration when designing the digital euro.[71] A proper technical, albeit legal, analysis on the topic should have been included in Chapter VII ("*Technical features*") of the Proposal. Second, there are several references throughout the text of the Proposal that hint the idea of different "*types*" of digital euro payment account, yet no concrete references whatsoever in the text.[72] Therefore, the European legislator is encouraged to clarify whether this is a possibility, and the consequences of such differentiation, or to improve the language in the Proposal to ensure clarity for the reader.

[67] See Article 29 ("*Compliance with Union sanctions adopted in accordance with Article 215 TFEU*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[68] See subsection 5.3.5 "*Verification of sanctions – Article 29 Proposal*" in Chapter 5 of the Thesis.

[69] *Id*.

[70] See note 178 in Chapter 6 of the Thesis.

[71] See note 158 in Chapter 6 of the Thesis.

[72] See note 161 in Chapter 6 of the Thesis.

7.2.7 Changes in Chapter IX ("*Anti-money laundering*")

Finally, the prospected changes in Chapter IX of the Proposal are limited to concrete definitions. In particular, the reference to anti-money laundering rules (AML) in Article 37 could improve by including an explicit reference to combating the financing of terrorism (CFT), since it is included in the analysis.[73] Since other sources of primary law of the European Union already refer to both, it would be recommended to update the title of the Chapter, as well as the title of the Article. Similarly, the lack of a definition for transaction data and for the Financial Intelligence Unit recommends the European legislator to provide sufficient context. In the case of the first, the difficulties may arise from the fact that "*transaction data*" may not be personal data, which causes the legal analysis to go beyond the privacy perspective.[74] In the case of the latter, the Financial Intelligence Unit is not defined in the Proposal, nor in Directive 2015/849 nor in COM/2021/420, as pointed out in Chapter 6 of the Thesis.[75] Consequently, it is not possible to understand who is part of said organism and which are its competences.

In addition to that, the reference to the upcoming substitute of the Money Laundering Directive needs to be adequately reflected throughout the text of the Proposal.[76] While some references in the Proposal identify the application of COM/2021/423, this is not included in Article 5 of the Proposal. This behaviour contradicts other legislative acts that are still conditional, such as COM/2023/366 final and COM/2023/367 final, as they will be replacing Directive (EU) 2015/2366 (PSD2) once they entry into force, which are included in Article 5 of the Proposal. What comes as difficult is the fact that COM/2021/423 it is included in Article 6 of the Proposal, increasing the confusion on the reader. Alignment between these two provisions and Chapter IX of the Proposal is required.

7.3 Key features analysed in the Thesis

Throughout the six previous chapters of the Thesis, a detailed legal analysis of the content of the Proposal has been provided, focusing on the considerations that bring the most

[73] See note 240 in Chapter 6 of the Thesis.
[74] See note 267 in Chapter 4 of the Thesis.
[75] See note 284 in Chapter 6 of the Thesis.
[76] See note 240 in Chapter 6 of the Thesis.

doctrinal complexity for both the legal academia and the European legislator. As a result, the content of each chapter provides insightful information concerning the upcoming issuance of the digital euro, considering each of the general topics addressed in the Proposal. This section points out the key aspects that have been analysed in each chapter of the thesis, paying special attention to the original ideas that have emerged from the analysis of the legal structure of the digital euro, thus providing a framework of reference that contributes in the same direction as the legal academia, towards a proper analysis of the consequences of the implementation of the digital euro.

Thus, the opening chapter[77] provides a thorough exploration of the evolving legal context surrounding digital payments. It reviews regulatory responses from 2007 to the present, highlighting significant milestones in the European Union and shifts in policy to adequately address the requirements of e-commerce.[78] The concept of central bank digital currency is introduced, along with a detailed categorisation and an analysis of the benefits associated to its implementation, as well as cases of use for a CBDC.[79] The context for the Proposal on the establishment of the digital euro is also provided, analysing its early conceptualisation, the initial concerns of the population, and the final design chosen for the digital manifestation of the single currency.[80] Finally, both the goal of the Thesis,[81] as well as the methodology employed, are addressed.[82]

For its part, Chapter 2 of the Thesis[83] delves into the legal concept of money, examining how the digital euro fits within the existing legal constructs of the three functions of money: unit of account, store of value and means of payment.[84] After scrutinising the content of Chapter III of the Proposal,[85] the chapter focuses on the legal tender status of the digital euro.[86] This analysis includes the implications of the principle of mandatory acceptance, the requirement to accept the digital euro at full face value, and its capacity to discharge from debt obligations.[87] Furthermore, it addresses the limitations to said

[77] See Chapter 1 ("*Introduction*") of the Thesis.
[78] See section 1.1 "*Current legal context on digital payments*" in Chapter 1 of the Thesis.
[79] See section 1.2 "*Central bank digital currencies*" in Chapter 1 of the Thesis.
[80] See section 1.3 "*The digital euro*" in Chapter 1 of the Thesis.
[81] See section 1.4 "*Goal of this thesis*" in Chapter 1 of the Thesis.
[82] See section 1.5 "*Methodology*" in Chapter 1 of the Thesis.
[83] See Chapter 2 ("*The legal tender status of the digital euro*") of the Thesis.
[84] See section 2.1 "*Overview of the three functions of money: unit of account, store of value and means of payment*" in Chapter 2 of the Thesis.
[85] See section 2.2 "*Intro to Chapter III Proposal*" in Chapter 2 of the Thesis.
[86] See section 2.3 "*Legal tender status of the digital euro – Article 7 Proposal*" in Chapter 2 of the Thesis.
[87] *Id*.

principle of mandatory acceptance,[88] as well as the expected interaction between the digital euro and physical euro banknotes and coins.[89]

Chapter 3 of the Thesis[90] focuses on the content of Chapter V of the Proposal, analysing the digital euro's functions as both a store of value and a means of payment. It discusses the proposed holding limits for digital euro payment transactions, which aim to prevent excessive hoarding by digital euro users, ensuring financial stability and preventing undesired competition with commercial banks.[91] In addition to that, the design choice to prevent the digital euro from becoming an interest-bearing financial instrument is critically analysed, with alternative approaches already present in the European legal academia being considered.[92] Concerning the use of the digital euro as a means of payment, the obvious tension that exists between the mandatory acceptance derived from the legal tender status of the digital euro and the objective of the European Union's authorities to make the digital euro free for natural persons is addressed.[93] Finally, this chapter also analyses the incentive system designed to regulate the charges to merchants and inter-PSP fees that are imposed by PSPs, which is adequately designed to minimise the costs over time.[94]

On Chapter 4 of the Thesis,[95] the content of Chapters IV and VI of the Proposal is examined, focusing on the digital euro users, the distribution of the digital euro within the euro zone, and the digital euro payment services that are currently enunciated in the Proposal.[96] In particular, the role of PSPs in the distribution of the digital euro is considered, as well as essential features of digital euro payment services, such as waterfall and reverse-waterfall functionalities.[97] In addition to that, the legal considerations on the relationship that may arise between the European Central Bank, PSPs, and digital

[88] See section 2.4 "*Limitations to the principle of mandatory acceptance*" in Chapter 2 of the Thesis.
[89] See section 2.5 "*Interaction between the digital euro and euro banknotes and coins – Article 12 Proposal*" in Chapter 2 of the Thesis.
[90] See Chapter 3 ("*The digital euro as a store of value and as a means of payment*") of the Thesis.
[91] See subsection 3.2.3 "*Limits to the use of the digital euro as a store of value - Article 16 Proposal˝* in Chapter 3 of the Thesis.
[92] See subsection 3.2.3.3 "*The digital euro shall not bear interest – Article 16(8) Proposal˝* in Chapter 3 of the Thesis.
[93] See subsection 3.3.2 "*Tension: mandatory acceptance vs. free use by the citizenry*" in Chapter 3 of the Thesis.
[94] See subsection 3.3.4 "*Charges to merchants and inter-PSP fees*" in Chapter 3 of the Thesis.
[95] See Chapter 4 ("*Distribution of the digital euro*") of the Thesis.
[96] See section 4.2 "*PSPs and digital euro users - Article 13 Proposal*" in Chapter 4 of the Thesis.
[97] See subsection 4.2.3.3 "*Waterfall and reverse-waterfall functionalities - Article 13(4)*" in Chapter 4 of the Thesis.

euro users are analysed.[98] Later in the chapter, the access to the digital euro within the euro area is studied, focusing on the nature of the basic digital euro payment services described in Annex II of the Proposal,[99] the possible overlapping between the digital euro and a basic bank account as described in Directive (EU) 2014/92,[100] and the topic of digital and financial inclusion.[101] Finally, the access to the digital euro outside the euro area and the possibility of enabling cross-currency payments within the digital euro settlement infrastructure is analysed.[102]

Chapter 5 of the Thesis[103] scrutinises Chapter VII of the Proposal, focusing on the technical features included in the final design of the digital euro. Thus, the design and accessibility of the digital euro are considered,[104] as well as the existing differences between online and offline digital euro payment transactions,[105] with an additional analysis of the specific consideration for transactions in a proximity payment, which may escape the regular categorisation included in the Proposal.[106] Conditional digital euro payment transactions are analysed thoroughly to differentiate them from programmable money, as requested by the European legislator.[107] After that, several technical topics are studied, such as the explicit inclusion of European Digital Identity Wallets in the Proposal,[108] the specific considerations for the settlement of both online and offline digital euro payment transactions,[109] the improvements on fraud detection for online digital euro payment transactions over the existing regulatory framework,[110] and the

[98] See subsection 4.2.5 "*Legal relationship between the European Central Bank, PSPs and digital euro users - Article 13(6) Proposal*" in Chapter 4 of the Thesis.

[99] See subsection 4.3.1 "*Basic digital euro payment services – Article 14(1) and Annex II Proposal*" in Chapter 4 of the Thesis.

[100] See subsection 4.3.2 "*Overlapping between this Proposal and Directive (EU) 2014/92 – Article 14(2)*" in Chapter 4 of the Thesis.

[101] See subsection 4.3.3 "*Digital and financial inclusion – Article 14(4) and 14(5) Proposal*" in Chapter 4 of the Thesis.

[102] See sections 4.4 "*Access to the digital euro outside the euro area*" and 4.5 "*Cross-currency payments – Article 21 Proposal*" in Chapter 4 of the Thesis.

[103] See Chapter 5 ("*Technical features of the digital euro*") of the Thesis.

[104] See subsections 5.2.1 "*Accessibility and use – Article 22 Proposal*" and 5.2.2 "*Design of the digital euro – Article 22(2), (3), (4) and (5) Proposal*" in Chapter 5 of the Thesis.

[105] See subsection 5.2.3 "*Online and offline payment transactions – Article 23 Proposal*" in Chapter 5 of the Thesis.

[106] See subsection 5.2.3.1 "*The special consideration for transactions in a proximity payment – Article 23(3) Proposal*" in Chapter 5 of the Thesis.

[107] See subsection 5.2.4 "*Conditional digital euro transactions vs. Programmable money – Article 24 Proposal*" in Chapter 5 of the Thesis.

[108] See subsection 5.3.1 "*European Digital Identity Wallets – Article 25 Proposal*" in Chapter 5 of the Thesis.

[109] See subsection 5.3.6 "*Settlement of digital euro payment transactions – Article 30 Proposal*" in Chapter 5 of the Thesis.

[110] See subsection 5.3.8 "*General fraud detection and prevention mechanism – Article 32 Proposal*" in Chapter 5 of the Thesis.

difficulties surrounding the implementation of a system that ensures non-discriminatory access to mobile devices for the use of the digital euro while ensuring security for all its participants.[111]

Finally, Chapter 6 of the Thesis[112] reviews the content of Chapters VIII and IX of the Proposal, focusing on privacy and data protection, as well as AML/CFT measures, in digital euro payment transactions. Thus, after providing general context of the existing contradiction between privacy and digital payments,[113] the data that is processed by PSPs,[114] the European Central Bank,[115] and providers of support services[116] is analysed, focusing on the existing differences among them and the expected benefits in terms of privacy for prospective digital euro users. Concerning anti-money laundering measures, the structure for Chapter IX of the Proposal is first criticised,[117] and then its content, since it is focused solely on offline digital euro payment transactions.[118] In addition to that, since the proposed alternative for offline transactions cannot be considered optimal,[119] an alternative approach to anonymisation is offered.[120] Finally, the rationale for transaction and holding limits that only applies to offline digital euro payment transactions is adequately addressed,[121] closing the analysis of the content of the Proposal.

7.4 Limitations and future lines of research

As stated at the beginning of this final chapter of the Thesis, the aim of this study has been to analyse the legal structure of the digital euro as it is embodied in the Proposal for its establishment. While said objective is laudable in itself, the analysis of the Proposal and the rest of the relevant legislative acts that have been studied have proven that the analysis included here could benefit from an in-depth approach that focuses on some

[111] See subsection 5.3.9 "*Fair, reasonable and non-discriminatory access to mobile devices – Article 33 Proposal*" in Chapter 5 of the Thesis.
[112] See Chapter 6 ("*Privacy, data protection and AML/CFT requirements*") of the Thesis.
[113] See section 6.2 "*Privacy and digital payments*" in Chapter 6 of the Thesis.
[114] See section 6.4 "*Data processing by PSPs – Article 34 Proposal*" in Chapter 6 of the Thesis.
[115] See section 6.5 "*Processing by the ECB and national central banks – Article 35 Proposal*" in Chapter 6 of the Thesis.
[116] See section 6.6 "*Processing by providers of support services – Article 36 Proposal*" in Chapter 6 of the Thesis.
[117] See subsection 6.7.1.1 "*Critique – AML should have been addressed altogether*" in Chapter 6 of the Thesis.
[118] See subsection 6.7.2 "*Offline transactions only*" in Chapter 6 of the Thesis.
[119] See subsection 6.7.3.1 "*Critique – Is this the best possible alternative in terms of anonymity?*" in Chapter 6 of the Thesis.
[120] See subsection 6.7.3.2 "*Alternative approach to anonymisation*" in Chapter 6 of the Thesis.
[121] See subsection 6.7.4.1 "*Rationale for transaction and holding limits*" in Chapter 6 of the Thesis.

aspects of great relevance for the legal academia that still require additional research. This final section therefore presents those ideas that have been pointed out throughout the Thesis, in sequential order,[122] but which have not been analysed in depth. In any case, these limitations of the present study are postulated as interesting future lines of research for jurists and academics interested in the scientific progress of the implementation of the digital euro and other CBDCs around the globe.

A meta-analysis of the CBDC literature. While not everything considered in the specific literature on CBDCs can be of utility for the legal analysis of the digital euro, a systemic approach to all existing, yet relevant, literature could be of help to promote a holistic analysis on characteristics that may have been overlooked in the analysis presented in this Thesis. By doing so, a more comprehensive and complete study could have been done to support, or contrast, any decision made by the European legislator in the Proposal, resulting in a better final design for the digital euro once the Regulation entries into force. A systematic analysis like the one described could enable the study of every detail of the digital euro, generating relevant information for the European Union's authorities to improve the current content of the Proposal considering enhancements and alternatives that go beyond the minor suggestions described in this study.

Analysis of the rest of the CBDC projects ongoing around the globe. In a similar fashion, the analysis of other CBDC projects currently being considered around the world could also yield similar benefits for the digital euro. According to the CBDC tracker[123] and the Bank for International Settlements (BIS)[124] there are currently over 40 CBDC projects already in a pilot phase, with more than 80 monetary authorities around the globe considering the issuance of a CBDC. An integrative analysis of all of them,[125] focusing on the legal implications from a general perspective,[126] could render important conclusions

[122] The following limitations are addressed in the same order as they have been presented through the Thesis.

[123] See *Central Bank Digital Currency Tracker*, Atlantic Council. Available at: https://www.atlanticcouncil.org/cbdctracker/. Updated monthly, last accessed on September 20, 2024.

[124] See Boar, C., Holden, H., & Wadsworth, A. (2020). Impending arrival–a sequel to the survey on central bank digital currency. *BIS paper*, (107). See also Di Iorio, A., Kosse, A., & Mattei, I. (2024). Embracing diversity, advancing together-results of the 2023 BIS survey on central bank digital currencies and crypto.

[125] See Ozili, P. K. (2023). Central bank digital currency research around the World: a review of literature. *Journal of Money Laundering Control*, *26*(2), 215-226. The selected study has initiated a line of research in this direction, albeit limited. In line with the meta-analysis of the CBDC literature presented in the previous paragraphs, this line of research must aim at integrating all relevant CBDC projects ongoing, so they can be categorised and conclusions can be drawn from the experience obtained in each by the monetary authorities in charge of its issuance.

[126] It is not feasible to propose a comparative law study of this magnitude, because of the impossibility of mastering so many different jurisdictions. However, a general perspective considering consumer rights,

that may improve the upcoming implementation of the digital euro, as it would be backed up by the experience of all relevant monetary authorities and global key partners involved in CBDC projects.

In addition to the positive effects this analysis may bring to the legal academia studying the issuance of CBDCs in general, and the digital euro in particular, designing legal standards for the technology to be implemented could also become faster. In line with works such as the one of Sethaput et al. (2023),[127] a comparative analysis of the different architectures for a CBDC can be of help for legislators when determining the technology to be used, as they would be able to address the legal implications of a given choice in advance.

Cost-benefits analysis of the issuance of the digital euro. While the concept of seigniorage has been addressed in Chapter 2 of the Thesis,[128] its analysis has been limited to introducing the concept, yet additional research on this topic may improve the issuance of the digital euro. Because of this concept, it is known that the cost of issuing a currency can be technically calculated. Similarly, the theoretical costs associated to the issuance of the digital euro can also be determined, namely the costs associated with issuance, maintenance of the settlement infrastructure, as well as other indirect costs that may be implied from the legal text that enacts its issuance. A direct economic analysis[129] may be performed to determine the utility derived from its implementation. Not only this would enable an appropriate estimation of costs usable by the European Union authorities, but also would allow the European legislator to adequately ascertain the level of utility associated to each of the functionalities of the digital euro from a microeconomics perspective, enabling the possibility to focus on the characteristics that are relevant for the prospective digital euro users, and redirecting the minimal amount of resources to the rest which, despite being necessary because of several legal implications,[130] are not

civil law and international banking law convention may suffice to conduct a research project like the once referenced here.

[127] Sethaput, V., & Innet, S. (2023). Blockchain application for central bank digital currencies (CBDC). *Cluster Computing*, *26*(4), 2183-2197.

[128] See section 2.1 "*Overview of the three functions of money: unit of account, store of value and means of payment*" in Chapter 2 of the Thesis.

[129] See, e.g., Shavell, S. (2004). *Foundations of Economic Analysis of Law*. Harvard Publishin. See also Posner, R. A. (2014). Economic analysis of law. Aspen Publishing. The economic analysis of the law enables the possibility to design legal acts that maximise the net utility of the system in which they are to be implemented.

[130] E.g., technical supervision of the settlement infrastructure or AML/CFT control features. These two may not derive that much utility to prospective digital euro users according to an economic analysis of the Proposal, yet they are essential features that require resources from the authorities.

essential for most of the prospective stakeholders of the digital euro.

An adequate theoretical framework for the concept of money. The concept of money has been addressed in Chapter 2 of the Thesis in an attempt to reduce its legal existence to three fundamental characteristics that the legal academia has identified as the essential core of what constitutes money. However, in the same chapter, this self-conclusive analysis has been criticised because it neglects the inherent social nature of money and the factual impossibility to address its existence without considering other areas of knowledge, namely economics, politics, and sociology. As a consequence, the analysis of legal consideration of the digital euro as money, while not incorrect, only allows to draw moot conclusions: the digital euro is money because a legislative act, duly enacted, concedes it legal tender status.

The criticism included in Chapter 2 of the Thesis aims to initiate the debate among the legal academia for the development of a multidisciplinary approach that allows for a better explanation of what makes a given good to be considered money, beyond the classical legal approach based on the three functions of money. As proposed,[131] the holistic approach that enables the systems theory seems like an adequate starting point, as it has been able to act as a theoretical framework for disciplines in which complex systems are the norm. Analysing the concept of money under this theoretical framework is in itself a wide-ranging line of research, which, despite its enormous importance, requires a higher level of study and attention than what is possible in a work such as the present one, aimed at the legal analysis of a Proposal for Regulation of the European Union.

In-depth analysis of scenarios concerning the Proposal on the legal tender of euro banknotes and coins. Chapter 2 of the Thesis[132] addresses several apparent contradictions that may appear concerning the legal tender status of both the digital euro and euro banknotes and coins. An in-depth analysis of the apparent contradiction should be performed to support the task of the European regulator when designing the implications of the legal tender status of both physical and digital euro, as well as their expected interaction. Despite being pointed out in the Thesis, throwing preventive caution to the European legislator, the complexity of this topic recommends studying the legal consequences of the current considerations on legal tender to ensure a smooth interaction

[131] See Chapter 2 ("*The legal tender status of the digital euro*") of the Thesis.
[132] See section 2.5 "*Interaction between the digital euro and euro banknotes and coins – Article 12 Proposal*" in Chapter 2 of the Thesis.

between both manifestations, physical and digital, of the single currency.

Cross-currency payments analysis in Chapter 4 of the Thesis. This topic requires a deeper analysis than the one presented in this Thesis,[133] as it requires both a technical and legal analysis of the current state of both technology standards involved and the applicable legal framework. While it was not the time to provide such an analysis, because the focus of this work must be the Proposal and what the implementation of the digital euro entails, the provision of an adequate legal framework for the likely implementation of cross-currency payments in the digital euro settlement infrastructure once issued recommends doing so.[134] A future line of research on this topic may progress in this direction, directly supporting the tasks of the European Union authorities, especially the European Central Bank, in determining the adequate legal design of such implementation.

Determination of uniform holding limits within the euro zone and among Member States whose currency is not the euro. The Proposal has determined that digital euro holding limits are to be uniform among Member States whose currency is the euro, as well as among Member States whose currency is not the euro, should the distribution of the digital euro in said Member States be authorised in the future. While this topic has been introduced in the Thesis,[135] it could benefit from empirical analysis using macroeconomic data and considering the propensity of each Member State to use the digital euro as a means of payment, as well as the specific issues concerning money laundering and the financing of terrorism that a given Member State may be facing, since they are not homogenous. This line of research recommends performing an economic analysis to effectively define an optimal holding limit for each Member State, subject to changes considering the adoption objectives laid down by the European Union's authorities and other concerns such as AML/CFT measures. Since this specific holding limit for each Member State would be contrary to the currently existing provisions in the Proposal, an adequate analysis to prove its recommended implementation is needed to sustain the legal change when justified to the European legislator.

Financial and digital inclusion. While this topic has been extensively addressed in Chapters 4 and 5 of the Thesis,[136] the analysis provided is not enough to adequately

[133] See section 4.5 "*Cross-currency payments – Article 21 Proposal*" in Chapter 4 of the Thesis.
[134] See subsection 4.5.3 "*Regulatory concerns*" in Chapter 4 of the Thesis.
[135] See Chapters 2 ("*The legal tender status of the digital euro*"), 3 ("*The digital euro as a store of value and as a means of payment*, and 4 ("*Distribution of the digital euro* of the Thesis.
[136] See subsections 4.3.3 "*Digital and financial inclusion – Article 14(4) and 14(5) Proposal*" in Chapter 4

deliver a well-formulated alternative to the terms currently included in the Proposal. As long as the criticism raised in said chapters is properly formulated, an inclusion de lege ferenda should have been incorporated in each sub-section to explicitly determine how the Proposal should address the issue on financial and digital inclusion. In particular, several aspects directly linked to financial and digital inclusion might benefit from additional exploration, enabling future lines of research such as the ones described below.

Thus, considering the objectives of financial inclusion of the underbanked population,[137] potential benefits derived from the issuance of the digital euro have been overlooked in the Proposal. Only generic references throughout the text have been included, without referencing concrete measures to improve the access of that sector of the population to financial intermediation services, especially when the European legislator has made explicit that the digital euro is not equivalent to a public banking account, despite its similarities.[138] Since the benefits associated to the implementation of the digital euro to the underbanked population had already been addressed by the European Union's authorities,[139] an in-depth analysis of the optimal design for the upcoming Regulation on its issuance could include concrete measures to achieve such objective. Said measures could include involving the public sector in the financial intermediation when accessing the digital euro services or the implementation of an improved version of the credit score[140] to ensure access to this sector of the population to better financing.

For its part, considering the objectives of digital inclusion of certain sectors of the population who struggle with technology or cannot access it, the Proposal does not address the topic accordingly, since it does not offer a concrete action plan. No official documentation has been published to this date concerning this issue, despite its explicit

and 5.3.9.1 "*Critique – The technological progress paradox*" in Chapter 5 of the Thesis.

[137] See subsection 4.3.3 "*Digital and financial inclusion – Article 14(4) and 14(5) Proposal*" in Chapter 4 of the Thesis.

[138] See subsection 4.3.2 "*Overlapping between this Proposal and Directive (EU) 2014/92 – Article 14(2)*" in Chapter 4 of the Thesis.

[139] See section 2 ("*Questions on the user perspective*") of the *Eurosystem report on the public consultation on a digital euro*, EUROPEAN CENTRAL BANK – EUROSYSTEM. Available at: https://www.ecb.europa.eu/pub/pdf/other/Eurosystem_report_on_the_public_consultation_on_a_digital_euro~539fa8cd8d.en.pdf. Published in April 2021. Last accessed on September 20, 2024.

[140] While the Court of Justice of the European Union held in Case C-634/21 that credit scoring constitutes an automated individual decision, which is prohibit under Article 22 of the General Data Protection Regulation (GDPR), an improved, beneficial, version of the idea could be implemented to facilitate the underbanked population to access financing through a positive review of the use of digital euro as a means of payment. The scope of this line of research recommends an in-depth analysis of the possibilities.

recognition in its Article 22.[141] Only minimal references to what needs to be done to ensure proper access to the digital euro for those in need of assistance can be found in the text, and even those can be improved.[142] In addition to that, the Proposal relies excessively on mobile devices to access and use the digital euro, and no analogue[143] alternatives have been included, increasing the risk of exclusion and unauthorised payment execution for non-tech-savvy prospective digital euro users.[144] A line of research focused entirely on designing the legal considerations to ensure adequate accessibility for these users to the digital euro must be developed, in line with some of the original ideas that have been included in this Thesis.[145]

In addition to the previous paragraph, the imposition of a given technological standard, such as the Proposal does in Article 22 for the European Digital Identity Wallets,[146] could benefit from additional support from the legal academia. While its inclusion has already been criticised in this Thesis,[147] a line of research focused on determining the adequate standard could improve the Proposal. Despite the European Central Bank's considerations on the topic,[148] the designation of technological standards, in line with the content of the European Accessibility Act,[149] would surely benefit from additional research on this direction.

Analysis on the optimal level of anonymisation for digital euro payment transactions. As analysed in Chapter 6 of the Thesis,[150] the European legislator has designed

[141] See Article 22 ("*Accessibility and use*") of the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

[142] E.g., the explicit references in Articles 25 ("*European Digital Identity Wallets*") and 28 ("*Front-end services to access and use the digital euro*") are meaningless since the requirements are moot.

[143] "*Analogue*" here is used as the opposite of "*digital*."

[144] E.g., elder people unable to properly unlock their mobile device usually does not impose security measures on it. This would make the user liable for unauthorized payments pursuant to the content of the Second Payment Services Directive (PSD2) when applicable, which would lead to fewer users deciding to adopt the digital euro as a means of payment.

[145] See subsection 5.3.9.1 "*Critique – The technological progress paradox*" in Chapter 5 of the Thesis.

[146] See *supra* note **??**.

[147] See subsection 5.3.1.1 "*Critique – Is this the best standard that is available?*" in Chapter 5 of the Thesis.

[148] See point 2.3 of the OPINION OF THE EUROPEAN CENTRAL BANK of 31 October 2023 on the digital euro (CON/2023/34). According to the European Central Bank, there are explicit provisions in the Proposal to support for less digitally sophisticated persons, included the explicit reference to European Digital Identity Wallets. However, an app-based solution is unlikely to become the optimal solution when dealing with sectors of the population who struggle to deal with technology. In addition to that, no analogue alternative is provided.

[149] See the Annex I ("*Accessibility requirements for products and services*") to Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services (European Accesibility Act.)

[150] See subsection 6.7.3.1 "*Critique – Is this the best possible alternative in terms of anonymity?*" in Chapter 6 of the Thesis.

digital euro payment transactions to provide a different level of privacy depending on whether the transaction is considered online or offline, not matching in any case the requests of prospective digital euro users.[151] While the provisions in the Proposal seem to match the requirements for AML/CFT measures enacted in the European Union, there is still room for improvement while ensuring the minimisation of dishonest behaviour by a concrete sector of the prospective digital euro users. In the Thesis, an alternative approach to anonymisation on both online and offline digital euro payment transactions have been proposed.[152] However, an in-depth analysis of this alternative can be performed in order to design an optimal level of privacy, encouraging other researchers to contribute to this direction.

A line of research could be developed in this direction. First, a theoretical analysis of the continuum from "*no supervision*" to "*complete supervision*" of digital euro payment transactions could be performed, to determine the risks associated at every point along the spectrum considered, including in the analysis all relevant legal provisions enacted in the European Union. This would enable the analysis of the potential benefits from alternative considerations in the Proposal. Second, the analysis could also include alternative approaches followed by other states currently implementing a CBDC project, since privacy can be enhanced attending to several different characteristics of a CBDC architecture. Third, the involvement of other areas of knowledge in the analysis, such as computer sciences, would contribute to developing a technological standard that satisfies both the legal requirements and the possibilities within the state-of-the-art measures in terms of digital payments technology.

The aforementioned analysis has been included as a limitation of the Thesis because of the difficulties surrounding the analysis of technical documentation on the digital euro. While technical documentation on the digital euro is often available, it is usually not meant to be available for the general public, but for implementation partners of the European Union's authorities. This reduces the possibility of expanding the analysis from a scientific perspective, since most of the time only pre-selected collaborators can access such documentation.[153] Consequently, the development of ideas in the technological realm is impacted, as it is the case in this Thesis, which is why a future line of research

[151] See subsection 1.3.2 "*Initial concerns of the population*" in Chapter 1 of the Thesis.
[152] See subsection 6.7.3.2 "*Alternative approach to anonymisation*" in Chapter 6 of the Thesis.
[153] In fact, even when said documentation is available, it cannot be referenced in a scientific work such as this, since it is not meant to be made public by its recipients.

on the topic, with a multidisciplinary approach, is encouraged.

Counterfeit analysis of offline digital euro payment transactions. As previously noted in Chapter 6 of the Thesis,[154] the technical implications concerning the prevention of counterfeit digital euro being produced are never addressed in the Proposal, despite being explicitly addressed in point 3 of Annex IV to the Proposal.[155] As the European legislator is concerned, offline digital euro payment transactions could be exploited to duplicate funds if no adequate security measures are implemented. However, the lack of action by the European Union's authorities to this extent recommends studying the state-of-the-art of the technology involved for the transactions, focusing on mobile devices used to enable offline digital euro payments, to analyse whether it is possible, how to prevent it and include specific sanctions to discourage this kind of dishonest behaviour.

[154] See subsection 6.5.1 "*Differences with Article 34 Proposal*" in Chapter 6 of the Thesis.

[155] See point 3 of Annex IV to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro. COM/2023/369 final.

Appendix A

Capitolo 1 - Introduzione

I pagamenti digitali sono diventati onnipresenti a partire dal 2020, con l'esplosione del Covid-19 nel suo primo trimestre, diventando il mezzo di pagamento preferito dalla fascia più giovane della popolazione in uno scenario in cui l'uso di banconote e monete fisiche sta lentamente decadendo.[1] Le autorità di regolamentazione di tutto il mondo hanno assistito alla proliferazione di una moltitudine di nuovi mezzi di pagamento che, se da un lato hanno migliorato la qualità della vita dei consumatori nella maggior parte dei casi, dall'altro hanno sollevato nuovi dilemmi normativi che hanno richiesto l'aggiornamento del quadro giuridico esistente per i pagamenti digitali. Così, mentre le banche commerciali sono diventate i leader di questa transizione verso i mezzi di pagamento digitali, queste autorità hanno trovato un nuovo concorrente nella comparsa dei cripto-asset, che non solo minacciano la sovranità monetaria delle banche centrali, ma rappresentano anche un pericolo per la stabilità del sistema finanziario nel suo complesso. L'esigenza di un mezzo di pagamento digitale pubblico, in grado di portare alle transazioni digitali i vantaggi dell'uso della moneta delle banche commerciali, è stata schiacciante, eppure si è concretizzata nella progettazione di valute digitali delle banche centrali, attirando l'interesse della maggior parte delle banche centrali delle economie di mercato.

In questo contesto, negli ultimi 5 anni le autorità dell'Unione europea hanno lavorato alla realizzazione del cosiddetto euro digitale. Dalla pubblicazione della relazione iniziale sulle possibilità di emissione dell'euro digitale, il progetto per la sua attuazione è progredito fino a diventare una realtà sotto forma di una proposta di regolamento volta a istituire l'euro digitale nel prossimo futuro. A causa della novità del suo contenuto,

[1] The footnotes in this chapter have been intentionally left out of the text. The reader is kindly requested to check the references, as needed, in Chapter 1 of the Thesis.

l'analisi giuridica di questa proposta legislativa potrebbe trarre beneficio da un'analisi completa e approfondita della sua portata, al fine di comprendere correttamente i tentativi del legislatore europeo di implementare un sistema di incentivi che inviti i principali partecipanti al sistema, principalmente i consumatori e i prestatori di servizi di pagamento, ad adottare volontariamente la nuova manifestazione digitale della moneta unica nell'Unione europea. In linea con questo obiettivo, il presente studio si propone di offrire un'attenta analisi della struttura giuridica dell'euro digitale, introducendo nell'analisi le conoscenze più recenti e rilevanti in materia, in vista di una loro piena integrazione nell'analisi giuridica della Proposta fornita dal mondo accademico del diritto.

Questo capitolo è strutturato come segue: in primo luogo, viene fornita una panoramica del contesto legale sui pagamenti digitali nell'Unione Europea. In secondo luogo, viene affrontato il concetto di moneta digitale della banca centrale, introducendo nello studio elementi che consentono di classificare le diverse tecnologie e architetture esistenti, nonché i vantaggi associati alla sua implementazione. In terzo luogo, l'euro digitale viene contestualizzato per consentirne l'analisi nei capitoli successivi di questa tesi. Infine, viene formulato e spiegato in modo approfondito l'obiettivo principale di questo studio, in relazione alla metodologia seguita per la realizzazione di questo lavoro.

A.1 L'attuale contesto giuridico dei pagamenti digitali: dalla PSD1 al MiCA.

La Direttiva 2007/64EC, comunemente nota come PSD1, è stata adottata per la prima volta nel 2007, fornendo le basi legali per un mercato unico dei pagamenti digitali, che ha permesso di offrire servizi di pagamento più sicuri e innovativi in tutta l'Unione Europea. L'obiettivo era quello di rendere i pagamenti transfrontalieri altrettanto facili, efficienti e sicuri dei pagamenti nazionali all'interno di uno Stato membro. L'attuazione della PSD1 intendeva modernizzare l'economia dell'Unione europea, che all'epoca era ostacolata dalla mancanza di un quadro giuridico comune e armonizzato in grado di unificare le operazioni di pagamento. Nonostante l'esistenza di precedenti atti dell'Unione Europea in materia, le misure adottate prima dell'attuazione della PSD1 non erano sufficienti, raccomandando la creazione di un quadro giuridico più moderno e coerente per i servizi di pagamento all'interno dell'Unione Europea. In questo contesto, l'adozione della PSD1

ha comportato una maggiore trasparenza e informazione per i consumatori, per quanto riguarda i tempi di esecuzione e le commissioni, e ha migliorato la posizione dei clienti, che hanno ottenuto un rafforzamento dei loro diritti di rimborso con una revisione chiarita della responsabilità prevista per ciascuna parte interveniente. Inoltre, il seme dei pagamenti istantanei nell'Unione Europea è stato inizialmente considerato nella PSD1.

Tuttavia, dopo la sua entrata in vigore all'inizio del 2008, la PSD1 ha iniziato a diventare obsoleta a causa del fiorente panorama dei pagamenti che aveva contribuito a sviluppare all'inizio. Per questo motivo, nel luglio 2013 la Commissione europea ha proposto di rivedere la PSD1 come parte di un nuovo pacchetto di misure legislative sui servizi di pagamento, che comprende anche il regolamento sulle commissioni di interscambio. Il numero di prestatori di servizi di pagamento (PSP) nell'Unione Europea era aumentato, così come il numero di servizi che essi fornivano agli utenti, rendendo necessaria una revisione del quadro giuridico unificato sui servizi di pagamento digitali all'interno dell'Unione Europea. Con l'arrivo del 2015, nasce la Direttiva (UE) 2015/2366, comunemente nota come PSD2.

Le autorità dell'Unione Europea erano consapevoli dei progressi compiuti nell'integrazione dei pagamenti al dettaglio all'interno dell'Unione grazie alla PSD1, ma riconoscevano che i pagamenti digitali avevano beneficiato dei progressi tecnologici successivi alla sua adozione, in particolare con la rapida crescita del numero di pagamenti elettronici e mobili, mettendo in discussione il quadro giuridico esistente all'epoca. Poiché aree significative del mercato dei pagamenti al dettaglio, in particolare i pagamenti tramite carte, Internet e dispositivi mobili, rimanevano frammentate lungo i confini nazionali all'interno dell'Unione Europea e molti prodotti o servizi di pagamento innovativi non potevano essere regolamentati ai sensi della PSD1, La PSD2 è stata concepita per migliorare la qualità dei servizi di pagamento offrendo un quadro giuridico stabile con un desiderio di permanenza, consentendo l'adozione di nuove tecnologie di pagamento, all'epoca non previste a causa dei limiti della tecnologia, migliorando quelle aree in cui la PSD1 non era riuscita ad anticipare i nuovi modelli di business. Con un recepimento parzialmente rinviato al 2020, PSD2 è entrata in vigore rafforzando i diritti di rimborso oltre quanto fatto dalla PSD1 e introducendo l'autenticazione forte del cliente (SCA) e la possibilità di usufruire di sensori biometrici come metodo valido di tale metodo di autenticazione rafforzato.

Nonostante il successo della PSD2 nei suoi obiettivi, negli ultimi anni le tecnologie di trasformazione hanno migliorato il settore finanziario, consentendo la comparsa di attività finanziarie che richiedevano una regolamentazione specifica a causa della loro crescente popolarità e dell'elevata volatilità, minacciando sia i clienti che il sistema finanziario nel suo complesso. La comparsa di cripto-asset negli ultimi cinque anni ha spinto l'Unione Europea a fornire una risposta legislativa alla loro emissione non regolamentata, in quanto la PSD2 non era l'atto giuridico appropriato per affrontarli. Il Regolamento sui mercati dei cripto-asset, o MiCA, è entrato in vigore nel 2023 e fornisce un quadro giuridico armonizzato per i cripto-asset all'interno dell'Unione Europea, prevedendo regole specifiche per proteggere i consumatori e il sistema finanziario, garantendo al contempo una concorrenza leale.

La costante evoluzione a cui è soggetto il mercato dei pagamenti digitali ha portato le autorità dell'Unione Europea a migliorare, ancora una volta, il quadro giuridico esistente. Di fronte alla minaccia di perdere la sovranità monetaria a favore di cripto-asset che potrebbero sostituire l'uso della moneta unica nell'Unione europea nel commercio elettronico, la Commissione europea ha presentato un pacchetto legislativo per istituire un quadro per un euro digitale, garantendo al contempo il corso legale delle banconote e delle monete in euro fisiche in tutta l'area dell'euro, salvaguardando il ruolo essenziale della moneta della banca centrale all'interno dell'area dell'euro. Pertanto, la Proposta sull'istituzione dell'euro digitale mira a fornire alle persone fisiche e giuridiche residenti o stabilite in uno Stato membro la cui moneta è l'euro servizi di pagamento in euro digitali, consentendo a tali utenti di accedere a un mezzo di pagamento digitale pubblico equivalente alle banconote e alle monete in euro, essendo una responsabilità diretta della Banca centrale europea.

Per comprendere le implicazioni dell'emissione di un euro digitale è necessario affrontare la sua categoria tecnologica e le sue implicazioni legali prima di analizzare le specificità della proposta. Pertanto, nella prossima sezione si affronterà il concetto di moneta digitale della banca centrale (Central Bank Digital Currency, CBDC), fornendo un contesto sulla sua origine, la sua categorizzazione e i vantaggi associati alla sua emissione, così come considerati dalla Banca centrale europea.

A.2 Moneta digitale della banca centrale

Nella sezione precedente, l'implementazione delle valute digitali delle banche centrali (CBDC) è stata suggerita come risposta normativa alla crescente presenza di pagamenti digitali. In questo contesto, le CBDC sono state descritte come la manifestazione digitale della moneta della banca centrale, emesse da istituzioni pubbliche al servizio della popolazione alla ricerca di una nuova tecnologia che possa ridurre l'attuale dipendenza dai mezzi di pagamento privati emessi dalle banche commerciali, i cui interessi potrebbero non essere allineati con quelli dei cittadini. Mentre il concetto di CBDC è piuttosto omogeneo tra le autorità competenti e la letteratura specifica che analizza questo fenomeno, le funzionalità che una banca centrale può implementare nel suo CBDC sono varie, il che ne raccomanda l'analisi separata per garantire che il concetto sia chiaro per un lettore istruito o un conoscitore del diritto che si accinge ad affrontare un testo legale riguardante l'implementazione legale di un CBDC.

La necessità di un CBDC è stata studiata con attenzione anche dalle banche centrali e da altre autorità competenti, fornendo un'ampia serie di casi d'uso che raccomandano l'implementazione di un CBDC. Anche se non tutti gli scenari vantaggiosi presi in considerazione da queste autorità possono essere applicati a qualsiasi Paese, l'esame del potenziale di questa nuova tecnologia di pagamento consente di arricchire l'analisi del potenziale dei CBDC, soprattutto prima della loro implementazione, quando è possibile chiedere all'autorità di regolamentazione di prendere in considerazione caratteristiche aggiuntive in base alla loro utilità prospettica o al successo della loro applicazione in altri progetti.

L'inclusione di questa sezione trova la sua ragion d'essere nel fornire un contesto, nei termini descritti nei due paragrafi precedenti, all'implementazione e all'emissione dell'euro digitale nell'Unione europea. Per garantire che l'analisi condotta nei capitoli successivi sia allineata con la letteratura disponibile sui CBDC, proveniente da autori di rilievo in campo giuridico, economico e tecnologico, nonché dalle autorità monetarie internazionali, questo capitolo presenta concetti e considerazioni essenziali sulla nuova manifestazione digitale della moneta della banca centrale che è un CBDC.

Per raggiungere questo obiettivo, questa sezione è strutturata come segue: in primo luogo, viene analizzato il concetto di CBDC e viene fornita una descrizione adeguata

delle conseguenze della sua emissione. In secondo luogo, viene offerta una categorizzazione dei CBDC, accompagnata da un confronto delle architetture CBDC disponibili, considerando i diversi approcci tecnologici disponibili per l'implementazione. Inoltre, vengono proposte diverse considerazioni sulle possibilità che tali tecnologie comportano per l'implementazione di un CBDC. Infine, viene presentata una breve analisi dei casi d'uso rilevanti per un CBDC, basata sull'identificazione preliminare di scenari utili da parte delle autorità monetarie e sulla necessità di soluzioni alternative a quelle attualmente esistenti nel panorama dei sistemi di pagamento digitali. Nella sezione successiva, l'euro digitale, così come presentato nella Proposta , viene contestualizzato rispetto ai contenuti analizzati in questo capitolo, ponendo le basi per l'analisi giuridica presentata nel prosieguo della tesi.

A.2.1 Il concetto di CBDC e le sue implicazioni

Un primo esame del concetto di moneta digitale di banca centrale richiede l'analisi delle descrizioni fornite all'inizio della sua considerazione dalle autorità competenti. Così, un CBDC è stato definito come una forma digitale di moneta della banca centrale diversa dai saldi dei tradizionali conti di riserva o di regolamento, , ponendo le basi per considerare la principale innovazione associata alla sua emissione nella disponibilità del CBDC per l'uso da parte del pubblico. Tuttavia, questa definizione non coglie la totalità del concetto di CBDC, in quanto può anche essere definito come uno strumento di pagamento digitale, denominato nell'unità di conto nazionale, che costituisce una passività diretta della banca centrale disponibile per i pagamenti quotidiani. In breve, questa nuova manifestazione digitale della moneta della banca centrale mira a fornire alla popolazione un'alternativa pubblica ai mezzi di pagamento digitali attualmente esistenti, consentendone i vantaggi, ovvero il corso legale e la stabilità finanziaria, per il grande pubblico.

L'idoneità delle BCDC a fornire una risposta adeguata allo scenario descritto nella sezione precedente per i pagamenti digitali sembra piuttosto giustificata. La sovranità monetaria è in gioco quando si tratta di pagamenti digitali, poiché le banconote e le monete non possono essere utilizzate per il commercio elettronico, che è diventato predominante per ampi segmenti della popolazione dopo lo scoppio di Covid-19 nel 2020. I fornitori di servizi di pagamento stanno beneficiando del nuovo status quo in cui i consumatori sono obbligati a utilizzare i loro servizi per il commercio e, nonostante le

adeguate limitazioni che il quadro giuridico impone loro, sono liberi di imporre i propri interessi, che potrebbero non essere allineati con quelli della popolazione. Inoltre, la popolarità delle criptovalute, oggi un po' più controllate, ha fatto emergere un nuovo concorrente nel panorama dei pagamenti digitali, che potrebbe spostare definitivamente l'utilità della moneta delle banche centrali dal centro del sistema finanziario.

In questo contesto, diverse banche centrali in tutto il mondo hanno manifestato il loro interesse per l'emissione di una CBDC. Da circa 40 autorità monetarie consultate nel 2018, a quasi 80 nel 2023, progetti di CBDC in corso sembrano essere diventati una priorità negli ultimi anni. In particolare, 44 progetti di CBDC sono attualmente in fase pilota a settembre 2024, mentre 59 sono ancora in fase di ricerca o di sviluppo iniziale. Tuttavia, nonostante l'apparente interesse per l'emissione di una CBDC, alcune banche centrali hanno espresso le loro perplessità, trascurando la sua attuazione o ritardando il progetto a tempo indeterminato.

In ogni caso, i progetti CBDC non sono una categoria omogenea. Poiché la tecnologia dei pagamenti da implementare è variabile, ogni progetto presenta delle particolarità, che richiedono un'analisi generale delle diverse caratteristiche disponibili per comprendere appieno le implicazioni della loro emissione.

A.2.2 Categorizzazione delle architetture CBDC

Nonostante si alluda a una categoria tecnologica comune con una descrizione unificata, come affrontato all'inizio della sottosezione precedente, i CBDC sono variabili quando si confrontano progetti diversi a causa della loro natura intrinseca. Ogni Paese che prende in considerazione l'emissione di un CBDC si trova ad affrontare un contesto diverso, che raccomanda l'implementazione di un mezzo di pagamento digitale pubblico che vi si adatti adeguatamente. Pertanto, un'ampia analisi delle differenze tecnologiche essenziali che possono apparire quando si confrontano i progetti di CBDC migliora la capacità dell'analista legale di determinare il quadro giuridico più adatto richiesto per l'emissione di tale CBDC.

Per facilitare il riferimento scientifico, in questa sottosezione è stata utilizzata una convenzione sulle differenze tecnologiche delle CBDC generalmente accettata. In particolare, il lavoro di Auer & Böhme (2020), fornisce un ottimo background per garantire la differenziazione tra i CBDC in base a quattro caratteristiche tecniche essenziali: la natura

dei crediti di un CBDC e il ruolo della Banca Centrale, l'uso di infrastrutture convenzionali o di tecnologie a libro mastro distribuito (DLT) per il regolamento delle transazioni di pagamento, il fatto che il CBDC sia basato su conti o su token e la sua considerazione come CBDC all'ingrosso o al dettaglio.

A.2.2.1 La natura dei crediti di una CBDC e il ruolo della banca centrale

La natura dei crediti si riferisce alla garanzia associata ai fondi. In questo caso, si distinguono crediti diretti e crediti indiretti. Per la prima categoria, i fondi diventano una passività diretta nel bilancio della banca centrale, il che significa che tali fondi sono considerati moneta della banca centrale e sono garantiti dall'autorità monetaria stessa, potendo essere considerati privi di rischio. Dal canto loro, i fondi appartenenti alla categoria dei crediti indiretti non sono una passività diretta della banca centrale, ma dell'intermediario finanziario che si occupa della loro distribuzione, indipendentemente dal fatto che la loro emissione sia stata richiesta dall'autorità monetaria. Di conseguenza, i crediti indiretti non sono privi di rischio, poiché l'intermediario finanziario può essere interessato da problemi specifici per la sua attività o da un rischio sistemico in caso di crisi finanziaria.

Secondo la tassonomia proposta da Auer e Böhme (2020), una CBDC può essere considerata in tre diverse categorie in base alla natura dei suoi crediti nei confronti della banca centrale: CBDC indiretta, CBDC diretta e CBDC ibrida. Sebbene si possano ottenere configurazioni intermedie, gli autori considerano adeguatamente solo queste tre categorie per garantire chiarezza nell'affrontare i diversi tipi di CBDC.

Una CBDC indiretta è nota anche come architettura CBDC sintetica, a due livelli o a più celle. Il CBDC è un credito nei confronti di un intermediario. Gli intermediari gestiscono i pagamenti al dettaglio e sono responsabili delle azioni di conoscenza del cliente (KYC), in quanto sono loro ad essere in contatto con i clienti. In questa architettura, la Banca centrale gestisce solo i pagamenti all'ingrosso. In questo caso, l'architettura proposta per il CBDC non è molto diversa dall'attuale panorama dei pagamenti digitali, poiché gli utenti continueranno ad accedere ai pagamenti digitali utilizzando uno strumento finanziario gestito da intermediari finanziari. Mentre la banca centrale potrebbe ancora essere responsabile di altre caratteristiche progettuali del CBDC, gli utenti di avranno diritto a rivalersi solo sui suddetti intermediari. Pertanto, nonostante il nome, l'architettura

indiretta di un CBDC non comporta una manifestazione reale e nuova di un CBDC.

Nel caso di un CBDC diretto, questa architettura può essere realizzata in diversi modi, ovvero banconote digitali, che consente agli utenti finali di aprire conti bancari presso la banca centrale, o tramite un crypto-asset emesso dalla banca centrale, ma governato da tecnologie di distributed ledger. In questo caso, il CBDC è un credito diretto nei confronti della banca centrale, ma è la banca centrale che gestisce anche i pagamenti al dettaglio, anche se un certo livello di implicazione di altri intermediari finanziari potrebbe essere consentito da questa architettura per garantire la conformità con la normativa KYC. Questa architettura è rivoluzionaria, in quanto consentirebbe per la prima volta ai clienti di accedere direttamente al denaro della banca centrale, contrariamente allo stato attuale della politica monetaria di quasi tutti i Paesi del mondo, che lo impedisce. Tuttavia, anche nel caso in cui si permetta un intervento minimo di terzi adeguati a supportare la banca centrale nei compiti essenziali, come descritto in precedenza, vi sono evidenti svantaggi che scoraggiano la scelta di questa architettura. Le banche centrali devono svolgere altre funzioni e non sono destinate ad agire come intermediari finanziari. L'abilitazione di questa architettura richiederebbe alle banche centrali un numero eccessivo di compiti, che potrebbero incidere sulle loro funzioni originarie.

Infine, un CBDC ibrido combina le caratteristiche degli altri due per raggiungere l'equilibrio, diventando l'opzione ovviamente preferita in termini di difficoltà di attuazione e di implicazioni legali per la banca centrale e per i potenziali utenti del CBDC. In questa architettura, quindi, il CBDC è un credito diretto sul bilancio della banca centrale, ma gli intermediari finanziari sono responsabili delle misure KYC e della gestione dei pagamenti al dettaglio. La banca centrale supervisiona il sistema, fornisce il supporto necessario, e aggiorna periodicamente i registri e i saldi al dettaglio, fornendo informazioni utili per le decisioni di politica monetaria. Lo svantaggio più evidente di questa architettura è che le banche centrali devono fare affidamento sugli intermediari finanziari per supportare la maggior parte dei servizi del CBDC, riducendo così al minimo l'impatto dell'implementazione di un CBDC nel sistema finanziario.

A.2.2.2 Infrastruttura convenzionale o DLT

La scelta di un'infrastruttura di regolamento del CBDC va oltre la tecnologia da utilizzare, poiché influisce anche sul modo in cui gli utenti possono accedere ai servizi del CBDC e

sul livello di privacy che può essere offerto per le transazioni. Per garantire che tutti i concetti siano affrontati in modo adeguato, entrambe le alternative saranno analizzate senza considerare l'interazione con le altre caratteristiche prese in considerazione in questa sezione.

Le banche centrali possono scegliere di utilizzare la tecnologia convenzionale per il regolamento delle loro transazioni in CBDC o di implementare un'infrastruttura basata sulla DLT. Se da un lato la prima opzione richiede il minor impegno, sia dal punto di vista tecnico che legale, dall'altro consente di implementare meno miglioramenti rispetto ai sistemi esistenti, poiché la tecnologia impiegata ha privilegiato un sistema stabile rispetto a innovazioni che distraggono. Un esempio di infrastruttura di regolamento convenzionale può essere il sistema di trasferimento espresso trans-europeo automatizzato di regolamento lordo in tempo reale (TARGET). Da parte sua, le tecnologie a libro mastro distribuito (DLT) sono state sviluppate negli ultimi decenni per sbloccare i vantaggi che possono derivare dalla decentralizzazione applicata alle transazioni finanziarie. Il suo principale svantaggio è associato all'incapacità di elaborare transazioni in modo massivo, sebbene questa tecnologia si stia evolvendo rapidamente per migliorarne l'efficienza. Un esempio di infrastruttura di regolamento basata sulla DLT è Ethereum.

Per comprendere le principali differenze tra le alternative convenzionali e quelle basate sulla DLT per l'infrastruttura di regolamento di un CBDC è necessario considerare il modo in cui i dati vengono aggiornati e archiviati in ciascun modello. Mentre le tecnologie convenzionali centralizzano l'archiviazione dei dati delle transazioni e il loro aggiornamento è monopolizzato dall'autorità competente, le alternative basate su DLT si affidano a più partecipanti all'infrastruttura di regolamento per convalidare e aggiornare i dati delle transazioni. Poiché le infrastrutture di regolamento DLT richiedono più partecipanti per convalidare qualsiasi transazione, in un processo chiamato "meccanismo di consenso", i tempi di elaborazione sono solitamente più lunghi rispetto ai sistemi convenzionali.

Un esempio significativo di un CBDC confermato che si basa su infrastrutture di regolamento convenzionali è l'euro digitale. L'Unione Europea potrebbe aver fatto da apripista con la sua adozione, soprattutto se si considera la riluttanza delle autorità monetarie competenti all'implementazione di sistemi DLT, soprattutto quando funzionalità specifiche, come i pagamenti offline, vengono testate con queste nuove infrastrutture di

regolamento. Ciò ha dato vita a un dibattito sull'adeguatezza dell'implementazione delle infrastrutture di regolamento DLT per i servizi CBDC, nonché a critiche sulla necessità o meno dei CBDC.

A.2.2.3 Basato su account o su token

La fornitura dell'accesso ai servizi del CBDC è un'altra questione rilevante per la scelta dell'architettura, in quanto influisce sul livello di privacy offerto ai potenziali utenti del CBDC. In questo caso, le alternative considerate sono i CBDC basati su account e quelli basati su token.

Per i CBDC basati su un conto, la proprietà dei fondi è legata all'identità e i crediti sono rappresentati in un database, come in un classico conto bancario. Questo modello fornisce alle autorità informazioni rilevanti sull'origine dei fondi e sui dati delle transazioni, in linea con i requisiti antiriciclaggio (AML) e di lotta al finanziamento del terrorismo (CFT) in vigore nella maggior parte dei Paesi. L'ovvia contropartita si concretizza in termini di privacy: il CBDC è meno simile alle banconote e alle monete e inizia a essere monitorato proprio come il denaro delle banche commerciali. Di conseguenza, le autorità beneficiano di migliori informazioni per prevenire comportamenti finanziari indesiderati, ma i potenziali utenti sono riluttanti a utilizzare la CBDC, poiché temono di essere controllati nelle loro transazioni.

Da parte sua, nei CBDC basati su token la proprietà non si basa sull'identificazione, ma sulla conoscenza di un valore criptato. Pertanto, i fondi in una CBDC basata su token possono essere utilizzati da qualsiasi persona a conoscenza del codice, il che comporta preoccupazioni in merito alle misure antiriciclaggio e al finanziamento del terrorismo, nonché la distruzione o l'impossibilità di utilizzare i fondi nel caso in cui l'utente dimentichi il valore criptato. Se da un lato questo sistema garantisce il massimo livello di privacy agli utenti, come descritto in precedenza, dall'altro può causare un ulteriore problema: poiché i fondi sono limitati dalla crittografia, i fondi possono diventare non fungibili, aumentando la difficoltà di utilizzare la CBDC come mezzo di pagamento, cosa che sembra essenziale per la sua implementazione. D'altra parte, l'approccio basato sui token consentirebbe l'implementazione di nuove tecnologie per le transazioni di pagamento quotidiane, come la moneta programmabile e i contratti intelligenti, che sono valide aggiunte a una CBDC, ma si scontrano con l'approccio convenzionale seguito in

una CBDC basata sul conto.

Nonostante i suoi vantaggi, è difficile immaginare l'implementazione di una CBDC basata su token nella maggior parte dei Paesi occidentali, a causa dell'esistenza di quadri giuridici restrittivi in materia di AML/CFT. Inoltre, l'implementazione di una CBDC basata su token potrebbe scontrarsi con altri requisiti essenziali per la validità dello status di moneta a corso legale di tale CBDC. Così, la Banca Centrale Europea ha dichiarato che l'abilitazione della moneta programmabile, definita in modo simile all'approccio da seguire in un CBDC basato su token, impedirebbe inevitabilmente all'euro digitale di ottenere il suo status di moneta a corso legale, a causa della mancanza di piena convertibilità dei fondi considerati. Tuttavia, la Banca Centrale Europea ha testato tecnologie basate su token in passato e il linguaggio della Proposta potrebbe indicare che la suddetta asseverazione potrebbe non essere così rigida.

A.2.2.4 Wholesale oppure retail

L'ultima caratteristica presa in considerazione per le architetture CBDC si riferisce all'utente finale del sistema: un CBDC wholesale consente solo ad alcune istituzioni finanziarie nominate dalla banca centrale di facilitare i pagamenti, le rimesse e il regolamento di altri strumenti finanziari, mentre un CBDC retail consente a privati, famiglie e imprese di accedere ai suoi servizi. Per la semplicità del suo concetto, questa categoria è tipicamente utilizzata per definire i progetti di CBDC.

Si potrebbe tuttavia sostenere che solo i CBDC al dettaglio possono essere considerati una nuova tecnologia, poiché l'essenza di un CBDC all'ingrosso è disponibile ormai da decenni. A meno che un CBDC all'ingrosso non sia destinato a essere emesso su un'infrastruttura di regolamento basata sulla DLT, l'emissione di tale categoria da parte di una banca centrale è probabilmente da considerarsi superflua. Pertanto, nonostante la sua analisi sia necessaria dal punto di vista concettuale, dovrebbe limitarsi a comprendere la categoria, affidando l'analisi ai CBDC al dettaglio che costituiscono un progresso nel panorama dei sistemi di pagamento digitali.

A.2.2.5 Una nota sulle tecnologie emergenti e sul CBDC

Nonostante l'utilità che deriva dall'analisi di tutte le categorie precedenti, non tutte possono essere combinate in una manifestazione fattibile o utile di un CBDC. In effetti,

alcune combinazioni non potrebbero nemmeno essere considerate nuove tecnologie di pagamento, come si è detto in precedenza. Questa sottosezione affronta in particolare alcune particolarità relative all'adozione di tecnologie specifiche, come le infrastrutture di regolamento DLT, fornendo note su ciò che deve essere rivisto nel quadro giuridico esistente, considerato in generale.

Come anticipato nelle sottosezioni precedenti, è probabile che alcune caratteristiche dei CBDC vengano implementate insieme. Ad esempio, un CBDC al dettaglio che voglia diventare basato su token richiederebbe un'infrastruttura di regolamento DLT o l'implementazione di modifiche sostanziali alle infrastrutture convenzionali attualmente esistenti. In ogni caso, il quadro giuridico esistente dovrebbe essere aggiornato, sia per garantire l'accettabilità generale dei sistemi DLT, sia per abilitare nuove funzionalità nell'attuale tecnologia sottoposta a regolamentazione. Allo stesso modo, un CBDC basato su un conto che intenda beneficiare dell'implementazione di un'infrastruttura di regolamento DLT dovrebbe consentire una revisione degli atti giuridici che regolano il regolamento delle operazioni di pagamento per accogliere la nuova tecnologia o optare per una soluzione intermedia, come la blockchain autorizzata. Anche l'alternativa richiede una nuova regolamentazione, in quanto sarebbe necessario stabilire quali intermediari finanziari devono essere inclusi nel sistema, per quanto tempo e la periodicità dell'affiliazione, se necessario.

Considerando che l'aggiornamento del quadro normativo diventa un obbligo, nel caso in cui l'autorità monetaria di un determinato Paese decida di implementare un'infrastruttura di regolamento DLT, le soluzioni interconnesse possono agevolare il regolatore. Pertanto, un modello integrato consente di implementare sia un CBDC basato su un conto che un CBDC basato su un token che interagiscono quando necessario, apportando i vantaggi associati alle tecnologie di distributed ledger, in particolare gli smart contract, a un'infrastruttura di regolamento convenzionale.

A.2.3 Vantaggi e casi d'uso di un CBDC

Come già detto all'inizio di questo capitolo, le valute digitali delle banche centrali sono state viste come la migliore soluzione possibile per garantire alla popolazione l'accesso a un mezzo di pagamento digitale senza affidarsi, almeno in parte, agli interessi delle banche commerciali private, probabilmente disallineati rispetto a quelli del grande pubblico.

Tuttavia, per comprendere l'utilità di un CBDC, si raccomanda di analizzare casi d'uso specifici per far riferimento a come i pagamenti digitali possano trarre vantaggio dalla sua implementazione, soprattutto considerando che di recente sono sorte critiche sulla sua utilità attesa. Inoltre, vale la pena ricordare che la disponibilità di architetture multiple per un CBDC, come affrontato nella sezione precedente di questo capitolo, prevede l'esistenza di diversi casi d'uso per i quali la manifestazione digitale della moneta della banca centrale può essere utile. Di conseguenza, l'utilità derivante da ciascuna categoria deve essere considerata per valutare l'impatto della sua implementazione, migliorando la tecnologia attualmente esistente per i pagamenti digitali.

Pertanto, considerando i benefici associati al miglioramento dell'efficienza e della sicurezza dei pagamenti, l'implementazione del CBDC può contribuire a creare sistemi di pagamento digitali più efficienti, resilienti, e sicuri per tutti gli attori coinvolti, indipendentemente dall'infrastruttura scelta. Inoltre, la riduzione dei costi e l'aumento dell'efficienza del sistema bancario possono promuovere la concorrenza bancaria, migliorando la qualità del servizio per gli utenti. Allo stesso modo, il miglioramento della sicurezza con l'implementazione dei CBDC aumenta la fiducia nei pagamenti digitali e attira l'implementazione di nuove tecnologie nel sistema dei pagamenti al dettaglio. Anche i pagamenti transfrontalieri e tra valute diverse possono trarre vantaggio dall'emissione di un CBDC, poiché gli attuali sistemi interoperabili sono di proprietà privata. Infine, le transazioni offline in regime di CBDC migliorerebbero l'attuale standard delle carte di debito e di credito.

Da parte sua, l'emissione di una CBDC può migliorare l'adozione di misure di inclusione finanziaria e digitale, in particolare negli scenari in cui l'uso del contante diminuisce. L'accesso ai servizi finanziari per la popolazione non bancarizzata potrebbe migliorare grazie all'implementazione di un CBDC, accessibile ovunque tramite una connessione a Internet, se progettato per integrare le banconote e le monete fisiche. Sebbene le possibili caratteristiche di un CBDC, come la capacità di fruttare interessi, possano contribuire all'inclusione finanziaria, sono molto contestate in letteratura e dalle autorità monetarie, che ne raccomandano un'ulteriore analisi. Infine, alcuni autori hanno sostenuto che l'accesso universale è più facile da ottenere con infrastrutture basate su DLT e architetture basate su token.

Infine, l'impatto dell'implementazione di una CBDC è considerato molto positivo

per la politica monetaria del paese emittente, in quanto fornisce nuovi strumenti di politica monetaria alle banche centrali, garantendo al contempo la sovranità finanziaria della moneta. In primo luogo, una CBDC consentirebbe alla banca centrale di disporre di informazioni macroeconomiche in tempo reale, permettendo persino di prendere decisioni di politica monetaria senza precedenti, come l'helicopter money non convenzionale, in scenari di decadenza dell'uso di banconote e monete fisiche. In secondo luogo, la comparsa di valute digitali private potrebbe rappresentare la fine della sovranità monetaria. Infine, si può ritenere che anche la stabilità del sistema finanziario nel suo complesso tragga beneficio dall'emissione di una CBDC, in quanto riduce la dipendenza dalle banche commerciali private.

A.3 L'approccio dell'Unione europea al CBDC: l'euro digitale

Le possibilità di creare una moneta digitale della Banca centrale europea e dell'Eurosistema hanno iniziato a essere esaminate dalla Banca centrale europea e dall'Eurosistema prima dell'inizio di questo decennio, con la pubblicazione da parte dell'autorità monetaria della zona euro di un rapporto iniziale nell'ottobre 2020 per l'emissione del cosiddetto euro digitale. Dalla pubblicazione di quel rapporto, il progetto dell'euro digitale è progredito, concretizzandosi nel giugno 2023 nella Proposta sull'istituzione dell'euro digitale. Diversi aspetti progettuali dell'euro digitale, così come presentati nella Proposta, trovano la loro ragion d'essere nella fase di ricerca che si è svolta nel periodo intercorso tra le date citate. Di conseguenza, l'analisi di tale processo di ricerca permette di qualificare e comprendere il contenuto della Proposta, arricchendone l'analisi giuridica.

Con questo obiettivo, la presente sezione è strutturata come segue: in primo luogo, vengono affrontate le considerazioni iniziali relative all'emissione dell'euro digitale. In secondo luogo, si considerano le preoccupazioni e gli atteggiamenti dei cittadini dell'Unione europea nei confronti dell'implementazione dell'euro digitale. In terzo luogo, si analizzano brevemente le diverse fasi di ricerca e sviluppo che l'euro digitale ha attraversato. Infine, viene introdotta la Proposta sull'istituzione dell'euro digitale, giustificando le scelte progettuali finali effettuate e presentando un'analisi strutturale dell'atto legislativo.

A.3.1 Concettualizzazione iniziale

Considerando il contesto descritto nelle sezioni precedenti di questo capitolo, alla fine del 2020 la Banca centrale europea ha deciso di affrontare esplicitamente le sue intenzioni di progettare ed emettere una moneta digitale della banca centrale nell'area dell'euro. Pertanto, il Rapporto sull'euro digitale, , pubblicato dall'autorità monetaria dell'Unione europea nell'ottobre 2020, ha affrontato il concetto, la necessità, le implicazioni e le potenziali strategie di attuazione di una BCDC nota come euro digitale. Il Rapporto includeva la prima previsione delle autorità dell'Unione sull'euro digitale che è stata infine introdotta nella Proposta per l'istituzione dell'euro digitale nel giugno 2023, con notevoli assenze nelle caratteristiche inizialmente descritte, a testimonianza del fatto che la tabella di marcia iniziale è stata aggiornata nel tempo per portare un progetto finale più allineato con l'opinione dei cittadini.

La motivazione per un euro digitale nell'Unione europea è stata delineata dalla Banca centrale europea nel Rapporto, che si concentra sull'evoluzione dell'economia digitale e sulle crescenti esigenze di mezzi di pagamento digitali nell'ambito della digitalizzazione delle transazioni finanziarie e del calo dell'uso del contante, conseguenza della pandemia di Covid-19. L'autorità monetaria sottolinea quindi l'importanza dell'emissione di un CBDC per integrare il ruolo della moneta della banca centrale nella sua forma fisica, ovvero banconote e monete, consentendo alla popolazione di accedere ai pagamenti digitali con un'alternativa pubblica i cui incentivi non sono governati da considerazioni commerciali.

Come inizialmente descritto nel Rapporto, l'euro digitale è stato garantito per introdurre diversi vantaggi nel sistema dei pagamenti digitali, promuovendo l'inclusione finanziaria per la popolazione non bancaria, nonché caratteristiche di accessibilità per coloro che necessitano di inclusione digitale, e sostenendo la trasmissione della politica monetaria della Banca Centrale Europea. L'euro digitale è stato indicato come un'alternativa sicura e conveniente al contante e alla moneta delle banche commerciali, in grado di offrire ai consumatori un mezzo di pagamento digitale affidabile, sostenuto dalla banca centrale, ma che coinvolge parti private rilevanti nel suo sviluppo per garantire che il progresso tecnologico non venga ostacolato.

Il Rapporto comprendeva un'analisi generale dei requisiti impliciti per l'emissione dell'euro digitale e delle caratteristiche che esso deve possedere per contribuire agli

obiettivi brevemente descritti nel paragrafo precedente. In particolare, il Rapporto ha preso in considerazione le esigenze e le preferenze degli utenti, come la facilità d'uso e l'accessibilità, con l'interoperabilità essenziale, la privacy e la protezione dei dati, introducendo la tensione tra la tracciabilità e il desiderio di anonimizzazione, nonché la sicurezza nelle transazioni. In ogni caso, la descrizione delle esigenze e dei casi d'uso è stata volutamente ampia, poiché molte scelte progettuali erano ancora poco chiare all'epoca.

Anche la base giuridica per l'emissione dell'euro digitale è stata affrontata nel Rapporto, anche se in modo limitato. La base giuridica per l'emissione dell'euro fisico è stata introdotta come disposizione abilitante comune, garantendo la competenza delle autorità dell'Unione europea per questo compito. Tuttavia, poiché l'architettura dell'euro digitale non era ancora definitiva, l'analisi giuridica inclusa nel Rapporto era ampia, in modo da consentire al mondo accademico di proporre negli anni successivi ogni tipo di analisi giuridica sull'argomento.

A.3.2 Preoccupazioni iniziali della popolazione

Dopo la pubblicazione del Rapporto alla fine del 2020, nell'aprile 2021 l'Eurosistema ha pubblicato i risultati della consultazione pubblica sull'emissione dell'euro digitale. La consultazione pubblica, lanciata il 12 ottobre 2020 e durata fino al 12 gennaio 2021, comprendeva 18 domande volte a raccogliere le opinioni di cittadini e professionisti sull'eventuale emissione di un CBDC nell'area dell'euro, e ha rappresentato un importante contributo per le autorità dell'Unione europea per decidere se autorizzare o meno l'attuazione dell'euro digitale e quali scelte progettuali specifiche fossero necessarie.

Come si evince dai risultati pubblicati nel Rapporto sulla consultazione pubblica, diversi argomenti sono stati in cima alle preoccupazioni iniziali dei cittadini europei che hanno partecipato al sondaggio. In primo luogo, la caratteristica principale che l'euro digitale deve offrire è la privacy nelle operazioni di pagamento. Poiché l'euro digitale è stato concepito come una manifestazione digitale delle banconote e delle monete in euro, gli utenti hanno richiesto l'anonimato nelle transazioni, o la caratteristica più simile disponibile. Altrimenti, non avrebbero avuto alcun incentivo a passare da altri mezzi di pagamento digitali emessi da soggetti privati. In secondo luogo, la sicurezza nelle transazioni e la facilità d'uso sono state descritte come caratteristiche importanti, focal-

izzate sulle esigenze dei potenziali utenti dell'euro digitale che non hanno competenze digitali. Infine, le altre caratteristiche considerate più importanti sono il costo, per garantire che l'euro digitale possa essere gratuito per le persone fisiche, l'interoperabilità con il panorama dei pagamenti digitali già esistenti e l'inclusione finanziaria della popolazione non bancarizzata.

La relazione sulla consultazione pubblica ha inoltre fornito informazioni rilevanti sulla progettazione finale dell'euro digitale, in quanto sono state affrontate direttamente le misure antiriciclaggio (AML) e di lotta al finanziamento del terrorismo (CFT), nonché i limiti all'euro digitale come investimento. Gli intervistati hanno avuto l'opportunità di concretizzare le loro preoccupazioni riguardo a queste limitazioni, ribadendo la loro preferenza per un euro digitale con funzionalità simili a quelle del contante, efficiente dal punto di vista dei costi rispetto ad altri metodi di pagamento esistenti e di facile accesso e utilizzo, anche se ciò significa dover sostenere alcune limitazioni.

A.3.3 Fasi di sviluppo

Dopo la pubblicazione del Rapporto sulla consultazione pubblica, l'Eurosistema ha confermato il lancio ufficiale del progetto dell'euro digitale nel luglio 2021. La prima fase, quella investigativa, è stata inizialmente considerata della durata di 24 mesi, mentre la Banca centrale europea si concentrava sulle preferenze degli utenti verso il design finale della manifestazione digitale della moneta unica. Questa fase è stata caratterizzata dalla pubblicazione da parte della Banca centrale europea di un rapporto sulle nuove tendenze dei pagamenti digitali nel marzo 2022, e di quattro rapporti sui progressi compiuti nella fase di indagine: due nel 2022, nel settembre e nel dicembre e due nel 2023, nell'aprile e nel luglio. Queste relazioni hanno evidenziato l'interesse dell'Unione europea ad analizzare tutte le caratteristiche rilevanti del potenziale CBDC da implementare nell'area dell'euro, prevedendo l'introduzione di una proposta per la creazione dell'euro digitale. Inoltre, nel novembre 2022, la Banca centrale europea ha organizzato, insieme alla Commissione europea, una conferenza sull'euro digitale intitolata "Towards a legislative framework for a digital euro". Questa conferenza ha permesso ai responsabili politici e alle parti interessate di discutere i principali aspetti normativi dell'euro digitale. Infine, a conclusione della fase di indagine, nell'ottobre 2023 è stata pubblicata una sintesi, , che raccoglie tutte le nozioni rilevanti già presentate nelle quattro precedenti, in linea con il

contenuto della recente Proposta sull'istituzione dell'euro digitale.

A.3.4 Proposta di Regolamento del Parlamento europeo e del Consiglio relativo all'istituzione dell'euro digitale

Il 28 giugno 2023, la Commissione europea ha presentato la Proposta sull'istituzione dell'euro digitale come parte del pacchetto legislativo volto a stabilire un quadro per l'euro digitale, garantendo al contempo il corso legale delle banconote e delle monete in euro fisiche in tutta l'area dell'euro, salvaguardando il ruolo essenziale della moneta della banca centrale all'interno dell'area dell'euro. Il progetto finale preso in considerazione per l'euro digitale ha risposto alle preoccupazioni della popolazione rilevate nella relazione sulla consultazione pubblica del 2021, sostenendo al contempo le sue scelte nella relazione sulla fase di indagine del 2022 e del 2023.

Con la pubblicazione della Proposta, il progetto finale dell'euro digitale può essere affrontato e analizzato da un punto di vista legale, consentendo di studiare le sue disposizioni per determinare se le preoccupazioni della popolazione sono state effettivamente mitigate. A tal fine, nella prossima sottosezione si analizzeranno l'architettura e le caratteristiche principali dell'euro digitale come CBDC, mentre nella successiva si descriverà brevemente la struttura della Proposta. In questo modo, l'analisi della Proposta in questa Tesi può essere adeguatamente svolta nel suo contesto giuridico, relativo alla tecnologia impiegata per l'emissione dell'euro digitale e all'atto giuridico che la autorizza.

A.3.4.1 Perché un euro digitale nella forma descritta nella Proposta

L'euro digitale è una moneta digitale della banca centrale che mira a fornire un mezzo di pagamento digitale pubblico e gratuito ai residenti dell'area dell'euro, in linea con le esigenze e le preoccupazioni della popolazione dell'Unione europea espresse nel Rapporto sulla consultazione pubblica del 2021. Come descritto nella proposta, l'euro digitale è stato concepito per funzionare come un CBDC ibrido, basato su un conto e al dettaglio, che funziona in un'infrastruttura di regolamento convenzionale basata sulla tecnologia TARGET Instant Payment Settlement (TIPS). Ciò significa che l'euro digitale mira a fornire alcuni dei vantaggi associati all'implementazione di una moneta digitale di una banca centrale, ossia ridurre la dipendenza della popolazione dai mezzi di pagamento privati, garantendo al contempo che i prestatori di servizi di pagamento siano ancora al centro di

ogni transazione, in quanto sono stati inclusi come intermediari essenziali, che elaborano ogni operazione di pagamento in euro digitale, nonostante la manifestazione digitale della moneta unica sia una pretesa diretta rispetto alla Banca centrale europea, che non elabora le transazioni. In breve, rispetto a mezzi di pagamento digitali analoghi forniti da attori privati, l'euro digitale garantisce l'accettazione obbligatoria, una migliore privacy, e uno strumento finanziario privo di rischi e fornito a costo zero alle persone fisiche.

Tuttavia, nonostante i migliori sforzi delle autorità coinvolte nel suo sviluppo, i cittadini dell'Unione europea sono ancora riluttanti all'implementazione dell'euro digitale. Recenti sondaggi hanno mostrato una riduzione della percentuale di cittadini disposti a utilizzare l'euro digitale per integrare i mezzi di pagamento già esistenti, soprattutto dopo la pubblicazione della Proposta. Il rifiuto dell'euro digitale evidenzia la necessità di una revisione approfondita della Proposta, che preveda miglioramenti in linea con le preferenze dei potenziali utenti.

A.3.4.2 Analisi strutturale della Proposta

La Proposta per l'istituzione dell'euro digitale , pubblicata per la prima volta il 28 giugno 2023, comprende 85 considerando, 42 articoli e 5 allegati; gli articoli sono strutturati in dieci capitoli. Inoltre, come di consueto, la proposta è accompagnata da un memorandum esplicativo che fornisce informazioni rilevanti su alcune scelte progettuali effettuate per l'euro digitale. Di seguito viene fornita una breve descrizione della struttura della Proposta, così come descritta.

Per quanto riguarda il contenuto giuridico della Proposta, il Capitolo I, intitolato "Oggetto e definizioni", comprende gli articoli 1 e 2, che affrontano il contenuto annunciato nel titolo come previsto. Tale capitolo stabilisce l'ambito di applicazione e il contenuto della Proposta, garantendo al contempo un'adeguata definizione delle categorie rilevanti considerate nelle sue disposizioni. Dal canto suo, il Capitolo II, intitolato "Istituzione ed emissione dell'euro digitale", comprende gli articoli da 3 a 6 e fa riferimento alla natura dell'euro digitale come forma digitale della moneta unica nell'area dell'euro, all'autorità della Banca centrale europea di emetterlo, nonché alla legge applicabile e alle autorità competenti coinvolte nella creazione e nel successivo controllo dell'euro digitale. Questi due primi capitoli definiscono il quadro giuridico di base da applicare, oltre alla Proposta stessa, per l'emissione dell'euro digitale.

Il Capitolo III della Proposta, intitolato "Corso legale", comprende gli articoli da 7 a 12. Questo capitolo analizza il corso legale dell'euro digitale, una volta emesso, e le limitazioni, sia territoriali, sia basate su considerazioni personali del pagatore e del beneficiario, sia basate sulla natura del diritto monetario, del principio di accettazione obbligatoria per la manifestazione digitale dell'euro. Inoltre, viene affrontata l'interazione tra l'euro digitale e la sua controparte fisica, garantendo la sua convertibilità alla pari con le banconote e le monete in euro.

Nella Proposta, il Capitolo IV, intitolato "Distribuzione", comprende gli articoli 13 e 14. Questo capitolo determina le condizioni iniziali per la distribuzione dell'euro digitale all'interno dell'area dell'euro e stabilisce le considerazioni rilevanti per l'accesso ai servizi in euro digitale, come l'obbligo per alcuni prestatori di servizi di pagamento, in particolare gli istituti di credito, di fornire gratuitamente i servizi di pagamento in euro digitale di base, come considerato più avanti nella Proposta.

Dal canto suo, il Capitolo V della Proposta, intitolato "Uso dell'euro digitale come riserva di valore e come mezzo di pagamento", comprende gli articoli da 15 a 17. Mentre il primo di questi articoli stabilisce i principi di base che consentono l'uso dell'euro digitale come riserva di valore e come mezzo di pagamento, gli altri due includono limitazioni che limitano rispettivamente ciascuna delle caratteristiche, consentendo al contempo adeguati sistemi di controllo per garantire che l'euro digitale sia facilmente accessibile dai potenziali utenti e non sia svantaggiato dai prestatori di servizi di pagamento a favore di mezzi di pagamento analoghi di proprietà privata.

Il Capitolo VI della Proposta, intitolato "Distribuzione dell'euro digitale al di fuori dela zona euro", comprende gli articoli da 18 a 21. Analogamente al Capo IV della Proposta, il legislatore europeo ha affrontato qui le condizioni per la distribuzione dell'euro digitale, considerando questa volta i requisiti per l'autorizzazione di tale distribuzione negli Stati membri la cui moneta non è l'euro, nei Paesi terzi al di fuori dell'Unione europea, nonché la considerazione speciale per i Paesi terzi che hanno sottoscritto un accordo monetario con l'Unione. Infine, viene affrontata la possibilità di consentire i pagamenti cross-valutari con gli Stati membri la cui moneta non è l'euro, anche se solo come azione condizionale delle autorità monetarie coinvolte che avverrà dopo l'emissione dell'euro digitale.

Il Capitolo VII della Proposta, intitolato "Caratteristiche tecniche", presenta una struttura diversa e contiene due diverse sezioni. La prima sezione, intitolata "Funzionalità

dell'euro digitale", comprende gli articoli da 22 a 24 e fa riferimento a caratteristiche dell'euro digitale quali l'accessibilità e l'uso, le modalità online e offline dell'euro digitale e la possibilità di attuare operazioni di pagamento condizionate in euro digitale. La seconda sezione, intitolata "Modalità di distribuzione", comprende gli articoli da 25 a 33 e affronta considerazioni tecniche sull'emissione dell'euro digitale, come i servizi di front-end per l'accesso e l'utilizzo dell'euro digitale, l'interoperabilità prevista, i meccanismi di contestazione e la prevenzione delle frodi, il rispetto delle sanzioni emanate dall'Unione europea, il passaggio di emergenza da un fornitore di servizi di pagamento a un altro e l'inclusione digitale dei potenziali utenti dell'euro digitale.

Il Capitolo VIII della Proposta, intitolato "Vita privata e protezione dei dati", comprende gli articoli da 34 a 36. Questo capitolo riguarda le finalità lecite per le quali i prestatori di servizi di pagamento, la Banca centrale europea e le banche centrali nazionali e i fornitori di servizi di supporto possono trattare i dati relativi alle operazioni di pagamento digitale in euro, limitando i tipi di dati personali che possono raccogliere e trattare. Strettamente associato al tema della privacy, il Capitolo IX della Proposta, intitolato "Lotta al riciclaggio", comprende solo l'articolo 37, in cui il legislatore europeo affronta le misure antiriciclaggio e antitrust che si applicano specificamente alle operazioni di pagamento digitale in euro offline.

Infine, il Capitolo X della proposta, intitolato "Disposizioni finali", comprende gli articoli da 38 a 42 e tratta delle procedure pertinenti in relazione ad altre disposizioni della proposta, come il potere di adottare atti delegati della Commissione europea, il mandato alla Banca centrale europea di fornire relazioni sull'adozione e sull'uso dell'euro digitale una volta emesso per la prima volta e l'entrata in vigore del regolamento una volta che non sarà più una proposta.

Inoltre, la proposta comprende 5 diversi allegati che integrano il contenuto dei 10 capitoli summenzionati. Così, l'Allegato I alla Proposta, intitolato "Servizi di pagamento digitali in euro", contiene un elenco dei servizi digitali in euro, in una lista aperta che potrà essere aggiornata in futuro. L'Allegato II alla Proposta, intitolato "Servizi di pagamento digitali in euro di base", comprende un elenco aperto, anche in questo caso, di servizi di pagamento digitali in euro di base che devono essere forniti gratuitamente dagli enti creditizi alle persone fisiche residenti o stabilite nell'area dell'euro. Infine, gli allegati III , IV e V della proposta, intitolati rispettivamente "Dati personali trattati dai prestatori

di servizi di pagamento", "Dati personali trattati dalla Banca centrale europea e dalle banche centrali nazionali" e "Dati personali trattati dai prestatori di servizi di assistenza", delimitano il trattamento dei dati personali da parte di ciascuno dei diversi responsabili del trattamento dei dati considerati.

A.4 Obiettivo di questa tesi

Dopo aver affrontato con attenzione il contesto esistente del panorama dei pagamenti digitali e la necessità specifica dell'implementazione di una moneta digitale della banca centrale, l'euro digitale, nell'Unione Europea, è necessario presentare l'obiettivo di questo studio. Considerando quanto sopra, l'obiettivo principale di questa tesi è quello di fornire un'adeguata rassegna della struttura giuridica del prossimo euro digitale, concentrandosi su quegli aspetti che presentano la maggiore complessità dottrinale per il mondo accademico del diritto e per il legislatore europeo. A tal fine, nei prossimi capitoli del presente lavoro verrà presentata un'analisi approfondita della Proposta sull'istituzione dell'euro digitale.

È di fondamentale importanza fornire alle autorità dell'Unione europea un'analisi dottrinale sufficiente di tutti gli aspetti rilevanti che la Proposta comporta rispetto al progetto finale dell'euro digitale. Nella sua attuale fase di implementazione, l'euro digitale può ancora essere migliorato e il suo design può essere adattato per implementare i cambiamenti necessari, soprattutto dopo che il mondo accademico legale ha individuato i difetti rilevanti nella sua attuale formulazione presentata nella Proposta. Il legislatore europeo sta analizzando il corpus di analisi giuridiche in corso di pubblicazione per capire quali cambiamenti siano necessari e le motivazioni che li sottendono. Il momento giusto per proporre uno studio integrativo è adesso, mentre i cambiamenti sono ancora possibili.

Come brevemente introdotto nel paragrafo precedente, il mondo accademico legale di tutto il mondo ha mostrato un grande interesse per i temi delle valute digitali delle banche centrali, in generale, e dell'euro digitale, in particolare. Questa nuova manifestazione digitale della moneta della banca centrale ha il potenziale per rivoluzionare il panorama dei pagamenti digitali, ma l'approccio ottimale dal punto di vista legale rimane poco chiaro, poiché l'euro digitale è ancora una delle prime emissioni disponibili e molte autorità monetarie in tutto il mondo attendono questa esperienza per fornire le proprie

proposte legislative in materia. Tuttavia, nonostante l'interesse per l'argomento, non sono molti i lavori accademici che hanno affrontato le considerazioni contenute nella proposta. Sebbene esistano molte analisi giuridiche che adottano un approccio generale sul concetto di moneta digitale della banca centrale e sui suoi potenziali benefici, non sono molti gli studi che hanno affrontato scenari concreti che richiedono cambiamenti specifici nel quadro giuridico esistente, come la sua distribuzione o i rapporti giuridici che potrebbero sorgere tra i consumatori, i fornitori di servizi di pagamento e le banche centrali una volta implementata la moneta digitale della banca centrale. Questo problema diventa più pressante se affrontato dalla prospettiva specifica dell'euro legale: nonostante l'appello di alcuni autori, l'euro digitale potrebbe beneficiare di un'analisi completa e olistica della sua Proposta, consentendo la discussione all'interno del mondo accademico legale europeo al fine di portare proposte de lege ferenda basate sull'analisi dell'atto legale che è stato pubblicato.

L'implementazione dell'euro digitale è destinata ad avere un impatto su diverse aree legali, come il diritto civile, il diritto dei consumatori, il diritto della privacy o il diritto bancario, nell'Unione Europea. Al fine di fornire un adeguato supporto accademico per la sua emissione, il mondo accademico legale deve affrontare tutti gli argomenti rilevanti inclusi nella proposta e sostenere il suo progetto finale con un'analisi adeguata. Tuttavia, questo lavoro ha anche lo scopo di fornire una guida per i non addetti ai lavori interessati al progetto dell'euro digitale e alle opportunità di miglioramento che possono essere ancora prese in considerazione dall'Unione europea. Con questa vocazione, il lavoro intitolato "Struttura giuridica dell'euro digitale" è stato completato per fornire un'analisi completa e approfondita della Proposta sull'istituzione dell'euro digitale, che aspira ad avviare una discussione giuridica che porti a un migliore accesso ai pagamenti digitali nell'Unione europea per tutti i cittadini, indipendentemente dalla loro alfabetizzazione finanziaria o dalle loro capacità digitali.

A.5 Metodologia

Per raggiungere il suddetto obiettivo in questo lavoro, la metodologia di studio ha richiesto una maggiore contestualizzazione del concetto di moneta digitale della banca centrale (CDBC) prima di iniziare l'analisi giuridica concreta della Proposta sull'istituzione dell'euro

digitale, per due ragioni principali. In primo luogo, poiché il concetto di CDBC implica una tecnologia piuttosto nuova, gli autori che studiano il fenomeno della sua implementazione da parte delle autorità monetarie di tutto il mondo si sono confrontati con caratteristiche essenziali associate alla sua natura, richiedendo un approccio ampio alla letteratura specifica sul tema dal 2020. In secondo luogo, nonostante il presente lavoro sia incentrato sull'analisi giuridica della suddetta Proposta, la Commissione europea ne ha svelato il contenuto solo a fine giugno 2023. Di conseguenza, l'analisi giuridica vera e propria è stata concentrata nell'ultimo anno di permanenza nel programma di dottorato che promuove questa tesi.

Pertanto, la metodologia adottata per lo sviluppo di questo lavoro si è concentrata su una revisione approfondita dello stato dell'arte dei pagamenti digitali, comprese le tecnologie pertinenti, il regolamento delle transazioni di pagamento e il quadro giuridico già esistente all'interno dell'Unione europea; le valute digitali delle banche centrali, esplorando un'ampia letteratura sulla contestualizzazione concettuale, nonché le architetture e le tecnologie disponibili per la loro attuazione; e l'euro digitale stesso, concentrandosi sulla Proposta per la sua emissione, su altri documenti legali rilevanti pubblicati o commissionati direttamente dalla Banca centrale europea, dall'Eurosistema o dalla Commissione europea, nonché sulla letteratura incipiente che analizza diversi aspetti del suo design finale come previsto dal legislatore europeo.

Va inoltre sottolineato che questa metodologia di revisione sistematica della letteratura ha richiesto l'accesso a una letteratura che va oltre l'ambito degli studi giuridici, poiché per completare l'analisi dell'imminente implementazione dell'euro digitale sono stati consultati e studiati anche documenti tecnici e letteratura proveniente da fonti e autori economici. Sebbene questo approccio sia fuori dal comune, solo in questo modo è possibile effettuare un'analisi approfondita delle tecnologie considerate per l'emissione dell'euro digitale. Altrimenti, le definizioni giuridiche e le descrizioni dei fenomeni associati alla sua attuazione non possono cogliere la realtà che essi comportano.

Il risultato di questa metodologia di lavoro è uno studio sulla struttura giuridica dell'euro digitale, come stabilito nella Proposta, concretizzato in un'analisi olistica in sette capitoli. Inoltre, è stata inserita un'appendice per fornire definizioni e minimizzare la complessità concettuale che alcune categorie considerate nella Tesi possono comportare, ponendo le basi per un adeguato dibattito giuridico basato su considerazioni date e

non su rigide elucubrazioni. In considerazione di ciò, il presente lavoro è strutturato come segue: il presente capitolo fornisce un contesto sul quadro giuridico dei pagamenti digitali, affronta le considerazioni essenziali relative al concetto di moneta digitale della banca centrale e introduce la Proposta sull'istituzione dell'euro digitale. Il secondo capitolo presenta il concetto giuridico di moneta e introduce l'analisi del Capitolo III della Proposta, ovvero lo status di moneta a corso legale dell'euro digitale e le limitazioni che possono derivare dal principio di accettazione obbligatoria che esso comporta. Dal canto suo, il terzo capitolo esamina il contenuto del Capitolo V della Proposta, che tratta dell'uso dell'euro digitale come riserva di valore e mezzo di pagamento, determinando la logica delle limitazioni introdotte dal legislatore europeo. Il quarto capitolo analizza la distribuzione dell'euro digitale all'interno dell'area dell'euro e al di fuori di essa, ovvero negli Stati membri la cui moneta non è l'euro e nei Paesi terzi, nonché la possibilità di effettuare pagamenti cross-currency con l'euro digitale, concentrandosi sul contenuto dei Capitoli IV e VI della Proposta. Il quinto capitolo fornisce un'analisi approfondita delle caratteristiche tecniche da implementare con l'emissione dell'euro digitale, presentate nel capitolo VII, sezioni 1 e 2, della Proposta. Inoltre, nel sesto capitolo vengono affrontati i temi della privacy e della lotta al riciclaggio di denaro e al finanziamento del terrorismo, imitando l'introduzione di questi temi nei capitoli VIII e IX della Proposta. Infine, il capitolo finale di questa tesi funge da atto conclusivo, presentando una panoramica dell'attuale disegno dell'euro digitale, le modifiche previste nella versione definitiva del regolamento sull'istituzione dell'euro digitale, le caratteristiche chiave analizzate in questo lavoro e le future linee di ricerca che emergono da questa tesi di ricerca.

Appendix B

Capítulo 1 - Introducción

Los pagos digitales se han convertido en omnipresentes desde 2020, con el brote de Covid-19 en su primer trimestre, convirtiéndose en el medio de pago preferido por el sector más joven de la población en un escenario en el que el uso de billetes y monedas físicas decae lentamente.[1] Las autoridades reguladoras de todo el mundo han sido testigos de la proliferación de multitud de nuevos medios de pago que, si bien han mejorado la calidad de vida de los consumidores en su mayoría, han planteado nuevos dilemas regulatorios que han exigido actualizar el marco legal existente para los pagos digitales. Así, al convertirse los bancos comerciales en los líderes de esta transición hacia los medios de pago digitales, estas autoridades han encontrado un nuevo competidor en la aparición de los cripto-activos, que no sólo amenazan la soberanía monetaria de los bancos centrales, sino que también suponen un peligro para la estabilidad del sistema financiero en su conjunto. La necesidad de un medio de pago digital público, capaz de trasladar a las transacciones digitales las ventajas del uso del dinero de los bancos comerciales, ha sido abrumadora, pero se ha materializado en el diseño de las monedas digitales de los bancos centrales, atrayendo el interés de la mayoría de los bancos centrales de las economías de mercado.

En este contexto, las autoridades de la Unión Europea llevan 5 años trabajando en la implantación del denominado euro digital. Desde la publicación del informe inicial en el que se abordaban las posibilidades de emisión del euro digital, el proyecto para su puesta en marcha ha avanzado hasta convertirse en una realidad en forma de Propuesta de Reglamento destinada a establecer el euro digital en un futuro próximo. Debido

[1] The footnotes in this chapter have been intentionally left out of the text. The reader is kindly requested to check the references, as needed, in Chapter 1 of the Thesis.

a la novedad de su contenido, el análisis jurídico de esta propuesta legislativa podría beneficiarse de un análisis exhaustivo y en profundidad de su alcance, con el fin de comprender adecuadamente los intentos del legislador europeo de implementar un sistema de incentivos que invite a los principales participantes en el sistema, principalmente consumidores y proveedores de servicios de pago, a adoptar voluntariamente la nueva manifestación digital de la moneda única en la Unión Europea. En línea con este objetivo, este estudio pretende ofrecer un análisis cuidadoso de la estructura jurídica del euro digital, introduciendo en el análisis los conocimientos más recientes y relevantes sobre la materia, con vistas a su plena integración en el análisis jurídico de la Propuesta aportado por la academia jurídica.

Este capítulo se estructura de la siguiente manera: en primer lugar, se ofrece una visión general del contexto legal sobre pagos digitales en la Unión Europea. En segundo lugar, se aborda el concepto de moneda digital de banco central, introduciendo en el estudio elementos que permitan categorizar las diferentes tecnologías y arquitecturas que, a grandes rasgos, existen, así como los beneficios asociados a su implantación. En tercer lugar, se contextualiza el euro digital para permitir su análisis en los próximos capítulos de esta Tesis. Por último, se formula y explica en profundidad el objetivo principal de este estudio, en relación con la metodología seguida para la realización de este trabajo.

B.1 Contexto jurídico actual de los pagos digitales: de PSD1 a MiCA

La Directiva 2007/64/CE, comúnmente conocida como PSD1, se adoptó por primera vez en 2007, proporcionando la base jurídica para un mercado único de pagos digitales, lo que permitió servicios de pago más seguros e innovadores en toda la Unión Europea. El objetivo era que los pagos transfronterizos fueran tan fáciles, eficientes y seguros como los pagos nacionales dentro de un Estado miembro. La aplicación de la DSP1 supuso la modernización de la economía de la Unión Europea, que en aquel momento se veía obstaculizada por la falta de un marco jurídico común y armonizado que unificara las operaciones de pago. A pesar de la existencia previa de actos de la Unión Europea en la materia, las medidas adoptadas antes de la aplicación de la DSP1 no eran suficientes, recomendando el establecimiento de un marco jurídico más moderno y coherente para

los servicios de pago en la Unión Europea. En este contexto, la adopción de la DSP1 ha supuesto una mayor transparencia e información para los consumidores, en cuanto a plazos de ejecución y comisiones, así como una mejora de la posición de los clientes, que han visto reforzados sus derechos de reembolso con una revisión clarificada de la responsabilidad prevista de cada parte interviniente. Además, el germen de los pagos instantáneos en la Unión Europea se contempló inicialmente en la DSP1.

Sin embargo, tras su entrada en vigor a principios de 2008, PSD1 empezó a quedarse obsoleta debido al próspero panorama de pagos que había contribuido a desarrollar en un principio. Así, la Comisión Europea propuso revisar la DSP1 en julio de 2013 como parte de un nuevo paquete de medidas legislativas sobre servicios de pago, que incluía también el Reglamento sobre tasas de intercambio. El número de proveedores de servicios de pago (PSP) en la Unión Europea había aumentado, así como el número de servicios que prestaban a los usuarios, lo que exigía una revisión del marco jurídico unificado sobre los servicios de pago digitales en la Unión Europea. Con la llegada de 2015, nace la Directiva (UE) 2015/2366, comúnmente conocida como PSD2.

Las autoridades de la Unión Europea eran conscientes de los avances logrados en la integración de los pagos minoristas dentro de la Unión gracias a la DSP1, , aunque reconocían que los pagos digitales se habían beneficiado de los avances tecnológicos desde su adopción, en particular con el rápido crecimiento del número de pagos electrónicos y móviles, lo que ponía en entredicho el marco jurídico existente en aquel momento. Dado que importantes ámbitos del mercado de pagos minoristas, en particular los pagos con tarjeta, por internet y por móvil, seguían fragmentados a lo largo de las fronteras nacionales dentro de la Unión Europea y que muchos productos o servicios de pago innovadores no podían regularse con arreglo a la DSP1, La DSP2 se diseñó para mejorar la calidad de los servicios de pago ofreciendo un marco jurídico estable con voluntad de permanencia, que permitiera la adopción de nuevas tecnologías de pago, no previstas en su momento debido a las limitaciones de la tecnología, mejorando aquellos ámbitos en los que la DSP1 no había logrado anticipar nuevos modelos de negocio. Con una transposición parcialmente aplazada hasta 2020, PSD2 entró en vigor reforzando los derechos de reembolso más allá de lo que hacía PSD1 e introduciendo la autenticación fuerte de clientes (SCA) y la posibilidad de beneficiarse de sensores biométricos como método válido de ese método reforzado de autenticación.

A pesar del éxito de la PSD2 en sus objetivos propuestos, las tecnologías transformadoras han mejorado el sector financiero en los últimos años, permitiendo la aparición de activos financieros que requerían una regulación específica debido a su creciente popularidad y alta volatilidad, amenazando tanto a los clientes como al sistema financiero en su conjunto. La aparición de criptoactivos en los últimos cinco años empujó a la Unión Europea a dar una respuesta legislativa a su emisión no regulada, ya que la DSP2 no era el acto jurídico adecuado para abordarlos. El Reglamento sobre Mercados de Criptoactivos, o MiCA, entró en vigor en 2023 proporcionando un marco jurídico armonizado en criptoactivos dentro de la Unión Europea, proporcionando normas específicas para proteger a los consumidores y al sistema financiero, garantizando al mismo tiempo una competencia leal.

La constante evolución a la que está sometido el mercado de pagos digitales ha llevado a las autoridades de la Unión Europea a mejorar, una vez más, el marco jurídico existente. Ante la amenaza de perder soberanía monetaria en favor de los criptoactivos que pueden desplazar el uso de la moneda única en la Unión Europea en el comercio electrónico, la Comisión Europea presentó un paquete legislativo para establecer un marco para un euro digital, garantizando al mismo tiempo el curso legal de los billetes y monedas físicos en euros en toda la zona del euro, salvaguardando el papel esencial del dinero del banco central dentro de la zona del euro. Así, la Propuesta sobre el establecimiento del euro digital tiene por objeto proporcionar a las personas físicas y jurídicas residentes o establecidas en un Estado miembro cuya moneda es el euro servicios digitales de pago en euros, permitiendo a dichos usuarios acceder a un medio de pago digital público equivalente a los billetes y monedas en euros, siendo responsabilidad directa del Banco Central Europeo.

Para comprender las implicaciones de la emisión de un euro digital es necesario abordar su categoría tecnológica y sus implicaciones jurídicas antes de analizar las particularidades de la Propuesta. Así, el concepto de moneda digital del banco central (CBDC) se aborda en la siguiente sección, proporcionando contexto sobre su origen, categorización y los beneficios asociados a su emisión, tal y como los considera el Banco Central Europeo.

B.2 Monedas digitales de banco central

En la sección anterior se ha sugerido la implantación de monedas digitales de banco central (CBDCs) como respuesta regulatoria a la creciente presencia de pagos digitales. En este contexto, las CBDCs han sido descritas como la manifestación digital del dinero del banco central, emitidas por instituciones públicas al servicio de la población en busca de una nueva tecnología que pueda reducir la actual dependencia de los medios de pago privados emitidos por los bancos comerciales, cuyos intereses pueden no estar alineados con los de los ciudadanos. Si bien el concepto de CBDC es bastante homogéneo entre las autoridades competentes y la literatura específica que analiza este fenómeno, las funcionalidades que un banco central puede implementar en su CBDC son variadas, recomendando su análisis por separado para asegurar que el concepto sea claro para un lector culto o conocedor jurídico que se disponga a abordar un texto legal relativo a la implementación legal de un CBDC.

La necesidad de un CBDC también ha sido estudiada con detenimiento por los bancos centrales y otras autoridades competentes, que han proporcionado una amplia enumeración de casos de uso que recomiendan la implantación de un CBDC. Aunque no todos los escenarios beneficiosos considerados por dichas autoridades pueden ser de aplicación a cualquier país, la revisión del potencial de esta nueva tecnología de pagos permite enriquecer el análisis del potencial de los CBDC, especialmente antes de su implantación, cuando es posible solicitar al regulador que se consideren características adicionales en función de su utilidad prospectiva o de la aplicación con éxito en otros proyectos.

La inclusión de este apartado encuentra su razón de ser en contextualizar, en los términos descritos en los dos párrafos anteriores, la implantación y emisión del euro digital en la Unión Europea. Para asegurar que el análisis realizado en los siguientes capítulos está alineado con la literatura disponible sobre CBDC, procedente tanto de autores relevantes en los ámbitos jurídico, económico y tecnológico, como de las autoridades monetarias internacionales, este capítulo presenta conceptos y consideraciones esenciales sobre la nueva manifestación digital del dinero del banco central que es una CBDC.

Para lograr este objetivo, esta sección se estructura de la siguiente manera: en primer lugar, se analiza el concepto de CBDC y se ofrece una descripción adecuada de las

consecuencias de su emisión. En segundo lugar, se ofrece una categorización de los CBDC, acompañada de una comparación de las arquitecturas de CBDC disponibles teniendo en cuenta los distintos enfoques tecnológicos disponibles para su implementación. Además, se ofrecen varias consideraciones sobre las posibilidades que dichas tecnologías conllevan para la implantación de un CBDC. Por último, se presenta un breve análisis de casos de uso relevantes para un CBDC, basado en la identificación previa de escenarios útiles por parte de las autoridades monetarias y en la necesidad de soluciones alternativas a las actualmente existentes en el panorama de los sistemas de pagos digitales. A continuación, en el siguiente apartado, se contextualiza el euro digital tal y como se presenta en la Propuesta con respecto al contenido analizado en este capítulo, sentando las bases para el análisis jurídico que se presenta más adelante en la Tesis.

B.2.1 El concepto de CBDC y sus implicaciones

Una primera revisión sobre el concepto de moneda digital de banco central requiere analizar las descripciones aportadas en los albores de su consideración por las autoridades competentes. Así, una CBDC se ha definido como una forma digital de dinero del banco central diferente de los saldos en cuentas de reserva o de liquidación tradicionales, sentando las bases para considerar la principal innovación asociada a su emisión en la disponibilidad de la CBDC para su uso por el público en general. Sin embargo, esta definición no recoge la totalidad del concepto de CBDC, ya que también puede definirse como un instrumento de pago digital, denominado en la unidad de cuenta nacional, que es un pasivo directo del banco central disponible para los pagos cotidianos. En definitiva, esta nueva manifestación digital del dinero del banco central pretende ofrecer a la población una alternativa pública a los medios de pago digitales existentes en la actualidad, posibilitando sus ventajas, a saber, el curso legal y la estabilidad financiera, para el público en general.

La idoneidad de los CBDC para dar una respuesta adecuada al escenario descrito en el apartado anterior para los pagos digitales parece bastante justificada. La soberanía monetaria está en juego cuando se trata de pagos digitales, ya que los billetes y monedas no pueden utilizarse para el comercio electrónico, que se ha convertido en predominante para amplios segmentos de la población desde el estallido de Covid-19 en 2020. Los proveedores de servicios de pago se están beneficiando de este nuevo statu quo en el

que los consumidores están obligados a utilizar sus servicios para el comercio y, a pesar de las limitaciones adecuadas que les impone el marco legal, son libres de imponer sus propios intereses, que podrían no estar alineados con los de la población. Además, la popularidad de las criptomonedas, algo más controladas en la actualidad, ha supuesto la aparición de un nuevo competidor en el panorama de los pagos digitales, que podría desplazar definitivamente la utilidad del dinero de los bancos centrales del centro del sistema financiero.

En este contexto, varios bancos centrales de todo el mundo han manifestado su interés por emitir un CBDC. De unas 40 autoridades monetarias consultadas en 2018, a casi 80 en 2023, los proyectos de CBDC en curso parecen haberse convertido en una prioridad en los últimos años. En concreto, 44 proyectos de CBDC se encuentran actualmente en fase piloto en septiembre de 2024, y hasta 59 siguen en fase de investigación o desarrollo inicial. Sin embargo, a pesar del aparente interés en la emisión de un CBDC, algunos bancos centrales han expresado su preocupación, desatendiendo su puesta en marcha o retrasando el proyecto indefinidamente.

En cualquier caso, los proyectos de CBDC no constituyen una categoría homogénea. Dado que la tecnología de pagos a implantar es variable, cada proyecto presenta sus particularidades, lo que exige un análisis general de las distintas características disponibles para comprender plenamente las implicaciones de su emisión.

B.2.2 Categorización de las arquitecturas CBDC

A pesar de aludir a una categoría tecnológica común con una descripción unificada, como se ha abordado al principio del subapartado anterior, los CBDC son variables cuando se comparan diferentes proyectos debido a su naturaleza inherente. Cada país que se plantea la emisión de un CBDC se enfrenta a un contexto diferente, que aconseja la implantación de un medio de pago digital público que encaje adecuadamente en él. Así, un análisis amplio de las diferencias tecnológicas esenciales que pueden aparecer al comparar proyectos de CBDC mejora la capacidad del analista jurídico para determinar el marco jurídico más adecuado que se requiere para la emisión de dicha CBDC.

Para facilitar la referencia científica, en esta subsección se ha utilizado una convención de diferencias tecnológicas en los CBDC que goza de aceptación general. En particular, el trabajo de Auer & Böhme (2020), proporciona excelentes antecedentes para garantizar

la diferenciación entre CBDC en torno a cuatro características técnicas esenciales: la naturaleza de las reclamaciones de un CBDC y el papel del Banco Central, el uso de infraestructuras convencionales o de tecnologías de libro mayor distribuido (DLT) para la liquidación de operaciones de pago, si el CBDC está basado en cuentas o en tokens, y su consideración como CBDC mayorista o minorista.

B.2.2.1 La naturaleza de los créditos de un CBDC y el papel del banco central

La naturaleza de los créditos se refiere a la garantía asociada a los fondos. En este caso, diferenciamos entre derechos directos e indirectos. Para la primera categoría, los fondos se convierten en un pasivo directo en el balance del banco central, lo que significa que esos fondos se consideran dinero del banco central y están respaldados por la propia autoridad monetaria, siendo posible considerarlos libres de riesgo. Por su parte, los fondos bajo la categoría de créditos indirectos no son un pasivo directo del banco central, sino del intermediario financiero que se encarga de su distribución, sin importar que su emisión haya sido requerida por la autoridad monetaria. En consecuencia, los créditos indirectos no están exentos de riesgo, ya que el intermediario financiero puede verse afectado por cuestiones específicas de su actividad o por el riesgo sistémico en caso de crisis financiera.

De acuerdo con la taxonomía propuesta por Auer y Böhme (2020), un CBDC puede considerarse en tres categorías diferentes teniendo en cuenta la naturaleza de sus demandas con respecto al banco central: CBDC indirecto, CBDC directo y CBDC híbrido. Aunque pueden darse configuraciones intermedias, los autores consideran adecuadamente sólo estas tres categorías para garantizar la claridad al abordar los distintos tipos de CBDC.

Un CBDC indirecto también se conoce como arquitecturas CBDC sintéticas, de dos niveles o multiceldas. El CBDC es un derecho sobre un intermediario. Los intermediarios gestionan los pagos minoristas y se encargan de las acciones de conocimiento del cliente (CSC), ya que son los que están en contacto con los clientes. En esta arquitectura, el Banco central sólo gestiona los pagos al por mayor. En este caso, la arquitectura propuesta para el CBDC no difiere mucho del panorama actual de los pagos digitales, ya que los usuarios seguirán accediendo a los pagos digitales mediante un instrumento financiero gestionado por intermediarios financieros. Aunque el banco central podría seguir siendo el encargado de otras características de diseño del CBDC, los usuarios sólo tendrán derecho a reclamar a los intermediarios mencionados. Así pues, a pesar de su denominación, la arquitectura

indirecta para un CBDC no supone una manifestación real y novedosa de un CBDC.

En el caso de un CBDC directo, esta arquitectura puede lograrse de múltiples maneras, a saber, billetes digitales, permitiendo a los usuarios finales abrir cuentas bancarias en el banco central, o a través de un cripto-activo emitido por el banco central, pero gobernado por tecnologías de libro mayor distribuido. En este caso, el CBDC es un derecho directo sobre el banco central, pero es el banco central quien también gestiona los pagos minoristas, aunque en esta arquitectura podría permitirse un cierto nivel de implicación de otros intermediarios financieros para garantizar el cumplimiento de la normativa KYC. Esta arquitectura es revolucionaria, ya que permitiría a los clientes acceder directamente al dinero del banco central por primera vez, en contra de la situación actual de la política monetaria de la mayoría de los países del mundo, que lo prohíbe. Sin embargo, incluso en el caso de permitir una intervención mínima de terceros adecuados para apoyar al banco central en tareas esenciales como las descritas anteriormente, existen desventajas obvias que desaconsejan optar por esta arquitectura. Los bancos centrales deben cumplir otras funciones y no están concebidos para actuar como intermediarios financieros. Habilitar esta arquitectura exigiría a los bancos centrales incurrir en demasiadas tareas, lo que podría afectar a sus funciones originales.

Por último, un CBDC híbrido combina características de los otros dos para lograr el equilibrio, convirtiéndose en la opción preferida obvia en términos de dificultad de implantación e implicaciones legales para el banco central y los posibles usuarios del CBDC. Así pues, en esta arquitectura, el CBDC es un derecho directo sobre el balance del banco central, pero los intermediarios financieros se encargan de las medidas de conocimiento del cliente y de gestionar los pagos minoristas. El banco central supervisa el sistema, presta apoyo cuando es necesario, y actualiza periódicamente los registros y los saldos minoristas, lo que también aporta información útil para las decisiones de política monetaria. La desventaja más obvia de esta arquitectura es que los bancos centrales tienen que depender de los intermediarios financieros para apoyar la mayoría de los servicios de CBDC, minimizando así el impacto de la implantación de una CBDC en el sistema financiero.

B.2.2.2 Infraestructura convencional o DLT

La elección de la infraestructura de liquidación de la CBDC va más allá de la tecnología a utilizar, ya que también influye en la forma en que los usuarios pueden acceder a los servicios de la CBDC y en el nivel de privacidad que puede ofrecerse para las transacciones. Para garantizar que todos los conceptos se abordan adecuadamente, ambas alternativas se analizarán sin tener en cuenta su interacción con otras características consideradas en esta sección.

Los bancos centrales pueden optar por utilizar tecnología convencional para la liquidación de sus operaciones con CBDC o pueden optar por implantar una infraestructura basada en DLT. Si bien la primera opción es la que requiere menos esfuerzos, tanto desde el punto de vista técnico como jurídico, también permite implementar menos mejoras sobre los sistemas existentes, ya que la tecnología empleada ha priorizado un sistema estable frente a innovaciones que distraigan la atención. Un ejemplo de infraestructura de liquidación convencional podría ser el sistema automatizado transeuropeo de transferencia urgente para la liquidación bruta en tiempo real (TARGET, por sus siglas en inglés). Por su parte, las tecnologías de libro mayor distribuido (DLT, por sus siglas en inglés) se han desarrollado en las últimas décadas para desbloquear los beneficios que puede aportar la descentralización cuando se aplica a las transacciones financieras. Su mayor inconveniente está asociado a la incapacidad de procesar transacciones de forma masiva, aunque esta tecnología está evolucionando rápidamente para mejorar su eficiencia. Un ejemplo de infraestructura de liquidación basada en DLT podría ser Ethereum.

Para comprender las principales diferencias entre las alternativas convencionales y las basadas en DLT para la infraestructura de liquidación de un CBDC es preciso considerar cómo se actualizan y almacenan los datos en cada modelo. Mientras que las tecnologías convencionales centralizan el almacenamiento de los datos de las operaciones y su actualización está monopolizada por la autoridad pertinente implicada, las alternativas basadas en DLT se basan en múltiples participantes de la infraestructura de liquidación para validar y actualizar los datos de las operaciones. Dado que las infraestructuras de liquidación DLT requieren múltiples participantes para validar cualquier transacción, en un proceso denominado "mecanismo de consenso", el tiempo de procesamiento suele ser mayor que en los sistemas convencionales.

Un ejemplo notable de CBDC confirmada que se basa en infraestructuras de liquidación

convencionales es el euro digital. La Unión Europea puede haber abierto el camino con su adopción, sobre todo teniendo en cuenta la reticencia de las autoridades monetarias pertinentes a la implantación de sistemas DLT, especialmente cuando se prueban funcionalidades específicas, como los pagos fuera de línea, en esas nuevas infraestructuras de liquidación. Esto ha propiciado el debate sobre si la implantación de infraestructuras de liquidación DLT es adecuada para los servicios de CBDC, junto con críticas sobre si los CBDC son necesarios en absoluto.

B.2.2.3 Basado en cuentas o en *tokens*

Proporcionar acceso a los servicios de CBDC es otra cuestión relevante relativa a la selección de una arquitectura, ya que influye en el nivel de privacidad ofrecido a los posibles usuarios de la CBDC. En este caso, las alternativas opuestas consideradas son los CBDC basados en cuentas y los basados en tokens.

En el caso de los CBDC basados en cuentas, la propiedad de los fondos está vinculada a la identidad, y las reclamaciones están representadas en una base de datos, similar a una cuenta bancaria clásica. Este modelo proporciona a las autoridades información pertinente sobre el origen de los fondos y los datos de las transacciones, en consonancia con los requisitos de lucha contra el blanqueo de capitales (AML) y la financiación del terrorismo (CFT) que rigen actualmente en la mayoría de los países. La contrapartida obvia se materializa en términos de privacidad: el CBDC se parece menos a los billetes y monedas, y empieza a ser controlado igual que el dinero de los bancos comerciales. En consecuencia, las autoridades se benefician de una mejor información para prevenir comportamientos financieros no deseados, pero los posibles usuarios se muestran reacios a utilizar el CBDC, ya que temen ser controlados en sus transacciones.

Por su parte, en las CBDC basadas en tokens la propiedad no se basa en la identificación, sino en el conocimiento de un valor cifrado. Así pues, los fondos de una CBDC basada en tokens pueden ser utilizados por cualquier persona que conozca el código, lo que plantea problemas en relación con las medidas de lucha contra el blanqueo de capitales y la financiación del terrorismo, así como la destrucción o imposibilidad de utilizar los fondos en caso de que el usuario olvide el valor cifrado. Aunque este sistema garantiza el máximo nivel de privacidad a los usuarios, como se ha descrito anteriormente, puede causar un problema adicional: dado que los fondos están restringidos por el cifrado, los fondos

pueden dejar de ser fungibles, lo que aumenta la dificultad de utilizar el CBDC como medio de pago, lo que parece esencial para su implantación. Por otro lado, el enfoque basado en tokens permitiría la implementación de nuevas tecnologías a las transacciones de pago cotidianas, como el dinero programable y los contratos inteligentes, que son valiosas adiciones a un CBDC, aunque chocan con el enfoque convencional seguido en un CBDC basado en cuentas.

A pesar de sus ventajas, es difícil imaginar la implantación de una CBDC basada en tokens en la mayoría de los países occidentales debido a la existencia de marcos jurídicos restrictivos en materia de ALD/CFT. Además, la implantación de un CBDC basado en tokens puede chocar con otros requisitos esenciales para la validez del estatus de curso legal de dicho CBDC. Así, el Banco Central Europeo afirmó que la habilitación de dinero programable, definido de forma similar al enfoque a seguir en un CBDC basado en tokens, impediría inevitablemente que el euro digital alcanzara su estatus de moneda de curso legal debido a la falta de plena convertibilidad de los fondos considerados. Sin embargo, el Banco Central Europeo ha probado tecnologías basadas en tokens en el pasado y el lenguaje de la Propuesta puede indicar que la aseveración antes mencionada podría no ser tan estricta.

B.2.2.4 Mayorista o minorista

La última característica considerada para las arquitecturas de CBDC se refiere al usuario final del sistema: un CBDC mayorista sólo permite a determinadas instituciones financieras designadas por el banco central facilitar pagos, remesas, así como la liquidación de otros instrumentos financieros, mientras que un CBDC minorista permite a particulares, hogares y empresas acceder a sus servicios. Debido a la sencillez de su concepto, esta categoría suele utilizarse para definir los proyectos de CBDC.

Podría argumentarse, sin embargo, que sólo los CBDC minoristas pueden considerarse nueva tecnología, ya que la esencia de un CBDC mayorista está disponible desde hace décadas. A menos que un CBDC mayorista vaya a emitirse en una infraestructura de liquidación basada en DLT, es probable que la emisión de dicha categoría por un banco central se considere redundante. Así pues, a pesar de que su análisis es necesario desde el punto de vista conceptual, debería limitarse a comprender la categoría, confiando el análisis a los CBDC minoristas que constituyen un avance en el panorama de los sistemas

de pago digitales.

B.2.2.5 Nota sobre tecnologías emergentes y CBDC

A pesar de la utilidad que se desprende del análisis de todas las categorías anteriores, no todas ellas pueden combinarse en una manifestación factible o útil de una CBDC. De hecho, algunas de las combinaciones ni siquiera se considerarían nuevas tecnologías de pago, tal y como se ha considerado anteriormente. Esta subsección aborda en particular ciertas particularidades que rodean la adopción de tecnologías específicas, como las infraestructuras de liquidación DLT, aportando notas sobre lo que debe revisarse en el marco jurídico existente, considerado en sentido amplio.

Como se ha anticipado en subsecciones anteriores, es probable que ciertas características de la CBDC se implementen conjuntamente. Por ejemplo, una CBDC minorista que aspire a basarse en tokens requeriría una infraestructura de liquidación DLT o la introducción de cambios sustanciales en las infraestructuras convencionales existentes en la actualidad. En cualquier caso, debería actualizarse el marco jurídico vigente, bien para garantizar la aceptabilidad general de los sistemas DLT, bien para permitir nuevas funcionalidades en la tecnología actual objeto de regulación. Del mismo modo, un CBDC basado en cuentas que pretenda beneficiarse de la implantación de una infraestructura de liquidación DLT debería permitir una revisión de los actos jurídicos que regulan la liquidación de las operaciones de pago para dar cabida a la nueva tecnología u optar por una solución intermedia, como la blockchain autorizada. Incluso la alternativa requiere una nueva regulación, ya que sería necesario abordar qué intermediarios financieros se incluirán en el sistema, durante cuánto tiempo y la periodicidad de la afiliación, en caso necesario.

Teniendo en cuenta que la actualización del marco jurídico se convierte en una necesidad, si la autoridad monetaria de un determinado país decide implantar una infraestructura de liquidación DLT, las soluciones entrelazadas pueden facilitar la labor del regulador. Así, un modelo integrado ofrece la posibilidad de implantar tanto una CBDC basada en cuentas como una basada en tokens que interactúen cuando sea necesario, aportando las ventajas asociadas a las tecnologías de libro mayor distribuido, concretamente los contratos inteligentes, a una infraestructura de liquidación convencional.

B.2.3 Ventajas y casos de uso de un CBDC

Como ya se ha indicado al principio de este capítulo, las monedas digitales de los bancos centrales se han visto como la mejor solución posible para garantizar a la población el acceso a un medio de pago digital sin depender, al menos parcialmente, de los intereses de los bancos comerciales privados, probablemente desalineados con los del público en general. Sin embargo, para entender la utilidad de un CBDC, se recomienda analizar casos concretos de uso para referenciar cómo los pagos digitales pueden beneficiarse de su implantación, sobre todo teniendo en cuenta que recientemente han surgido críticas sobre su utilidad esperada. Además, cabe mencionar que la disponibilidad de múltiples arquitecturas para un CBDC, tal y como se ha abordado en la sección anterior de este capítulo, prevé la existencia de diferentes casos de uso para los que la manifestación digital del dinero del banco central puede ser útil. En consecuencia, la utilidad derivada de cada categoría debe ser considerada para evaluar el impacto de su implementación, mejorando la tecnología actualmente existente para los pagos digitales.

Así, teniendo en cuenta los beneficios asociados a la mejora de la eficiencia y seguridad de los pagos, la implantación de CBDC puede contribuir a crear sistemas de pago digitales más eficientes, resilientes, y seguros para todos los actores implicados, independientemente de la infraestructura seleccionada para ello. Además, la reducción de costes y el aumento de la eficiencia del sistema bancario pueden fomentar la competencia bancaria, mejorando la calidad del servicio para los usuarios. Del mismo modo, la mejora de la seguridad con la implantación de los CBDC aumenta la confianza en los pagos digitales y atrae la implantación de nuevas tecnologías en el sistema de pagos minoristas. Los pagos transfronterizos y entre divisas también pueden beneficiarse de la emisión de un CBDC, ya que los actuales sistemas interoperables son de propiedad privada. Por último, las transacciones fuera de línea bajo un régimen de CBDC mejorarían la norma actual para las tarjetas de débito y crédito.

Por su parte, la emisión de un CBDC puede mejorar la adopción de medidas de inclusión financiera y digital, especialmente en escenarios en los que disminuye el uso del efectivo. El acceso a los servicios financieros por parte de la población no bancarizada puede mejorar gracias a la implantación de una CBDC, accesible desde cualquier lugar utilizando una conexión a Internet, cuando se diseña como complemento de los billetes y monedas físicos. Aunque las posibles características de un CBDC, como la capacidad de

generar intereses, pueden contribuir a la inclusión financiera, son muy discutidas en la literatura y por las autoridades monetarias, lo que recomienda su análisis más detallado. Por último, algunos autores han afirmado que el acceso universal es más fácil de obtener con infraestructuras basadas en DLT y arquitecturas basadas en tokens.

Por último, el impacto de la implantación de un CBDC se considera muy positivo para la política monetaria del país emisor, ya que proporciona nuevas herramientas de política monetaria a los bancos centrales al tiempo que garantiza la soberanía financiera de la moneda. En primer lugar, un CBDC permitiría la disponibilidad de información macroeconómica en tiempo real para el banco central, permitiendo incluso decisiones inéditas de política monetaria como el helicopter money no convencional, en escenarios de decadencia del uso de billetes y monedas físicas. En segundo lugar, la aparición de monedas digitales privadas puede suponer el fin de la soberanía monetaria. Por último, también puede considerarse que la estabilidad del sistema financiero en su conjunto se beneficia de la emisión de un CBDC, ya que reduce la dependencia de los bancos comerciales privados.

B.3 La Unión Europea ante el desafío de la CBDC: el euro digital

Las posibilidades en torno a la creación de una moneda digital de banco central en la Unión Europea comenzaron a ser revisadas por el Banco Central Europeo y el Eurosistema antes del inicio de esta década, publicando la autoridad monetaria de la zona euro un primer informe en octubre de 2020 para abordar la emisión del denominado euro digital. Desde la publicación de dicho informe, el proyecto del euro digital ha ido avanzando, materializándose en junio de 2023 en la Propuesta sobre el establecimiento del euro digital. Varios aspectos del diseño del euro digital, tal y como se presentan en la Propuesta, encuentran su razón de ser en la fase de investigación que ha tenido lugar en el periodo comprendido entre las fechas mencionadas. En consecuencia, analizar dicho proceso de investigación permite matizar y comprender el contenido de la Propuesta, enriqueciendo su análisis jurídico.

Con este objetivo en mente, esta sección se estructura del siguiente modo: en primer lugar, se abordan las consideraciones iniciales relativas a la emisión del euro digital. En

segundo lugar, se consideran las preocupaciones y actitudes de los ciudadanos de la Unión Europea ante la implantación del euro digital. En tercer lugar, se estudian brevemente las distintas etapas de investigación y desarrollo por las que ha pasado el euro digital. Por último, se presenta la Propuesta sobre el establecimiento del euro digital, justificando las opciones finales de diseño adoptadas y presentando un análisis estructural del acto legislativo.

B.3.1 Conceptualización inicial

Teniendo en cuenta el contexto descrito en las secciones anteriores de este capítulo, el Banco Central Europeo decidió a finales de 2020 abordar explícitamente sus intenciones de diseñar y emitir una moneda digital de banco central en la zona del euro. Así, el Informe sobre un euro digital, publicado por la autoridad monetaria de la Unión Europea en octubre de 2020, abordaba el concepto, la necesidad, las implicaciones y las posibles estrategias de implementación de una CBDC denominada euro digital. El Informe recogía las primeras previsiones de las autoridades de la Unión sobre el euro digital que finalmente se introdujeron en la Propuesta para el establecimiento del euro digital en junio de 2023, con notables ausencias en las características inicialmente descritas, evidenciando que la hoja de ruta inicial se ha ido actualizando a lo largo del tiempo para aportar un diseño final más alineado con la opinión de los ciudadanos.

La motivación para un euro digital en la Unión Europea fue esbozada por el Banco Central Europeo en el Informe, centrándose en la evolución de la economía digital y las crecientes necesidades de medios de pago digitales en el auge de la digitalización en las transacciones financieras y la disminución del uso del efectivo, consecuencia de la pandemia del Covid-19. Así, la autoridad monetaria destaca la importancia de emitir un CBDC para complementar el papel del dinero del banco central en su forma física, es decir, billetes y monedas, permitiendo a la población acceder a los pagos digitales con una alternativa pública cuyos incentivos no se rijan por consideraciones comerciales.

Como se describió inicialmente en el Informe, el euro digital estaba garantizado para introducir varias ventajas en el sistema de pagos digitales, promoviendo la inclusión financiera para la población no bancarizada, así como características de accesibilidad para aquellos que necesitan la inclusión digital, y apoyando la transmisión de la política monetaria del Banco Central Europeo. Se hizo referencia al euro digital para proporcionar

una alternativa segura y rentable al efectivo y al dinero de los bancos comerciales, ofreciendo a los consumidores un medio de pago digital fiable que está respaldado por el banco central, pero que implica a las partes privadas pertinentes en su desarrollo para garantizar que no se obstaculiza el progreso tecnológico.

El Informe incluía un análisis general de los requisitos implícitos para la emisión del euro digital y de las características que debe reunir para contribuir a los objetivos brevemente descritos en el apartado anterior. En particular, el Informe consideraba las necesidades y preferencias de los usuarios, tales como la facilidad de uso y la accesibilidad, siendo esencial la interoperabilidad, la privacidad y la protección de datos, introduciendo la tensión entre la trazabilidad y el deseo de anonimización, así como la seguridad en las transacciones. En cualquier caso, la descripción de las necesidades y casos de uso era amplia a propósito, ya que muchas opciones de diseño aún no estaban claras en aquel momento.

La base jurídica para la emisión del euro digital también se abordó en el Informe, aunque escasamente. La base jurídica para la emisión del euro físico se introdujo como disposición habilitante común, garantizando la competencia de las autoridades de la Unión Europea para esta tarea. Sin embargo, dado que el diseño de la arquitectura del euro digital aún no era definitivo, el análisis jurídico incluido en el Informe era amplio a propósito, lo que permitiría al mundo académico presentar todo tipo de análisis jurídicos sobre el tema en los años siguientes.

B.3.2 Preocupaciones iniciales de la población

Tras la publicación del Informe a finales de 2020, el Eurosistema publicó los resultados de la consulta pública sobre la emisión del euro digital en abril de 2021. Dicha consulta pública se inició el 12 de octubre de 2020 y se prolongó hasta el 12 de enero de 2021, incluyendo 18 preguntas dirigidas a recabar las opiniones tanto de ciudadanos como de profesionales sobre la posible emisión de un CBDC en la zona euro, sirviendo como importante aportación para las autoridades de la Unión Europea sobre si autorizar la implantación del euro digital y qué opciones específicas de diseño eran necesarias.

Según los resultados publicados en el Informe sobre la consulta pública, varios temas encabezaban las preocupaciones iniciales de los ciudadanos europeos que participaron en la encuesta. En primer lugar, la característica clave que debía ofrecer el euro digital

era la privacidad en las operaciones de pago. Dado que se preveía que el euro digital actuara como manifestación digital de los billetes y monedas en euros, los usuarios exigían anonimato en las transacciones, o la característica más parecida disponible. De lo contrario, carecían de un incentivo evidente para pasar de otros medios de pago digitales emitidos por agentes privados. En segundo lugar, la seguridad en las transacciones, así como la facilidad de uso, se describieron como características importantes, centrándose en las necesidades de los futuros usuarios del euro digital que carecen de competencias digitales. Por último, el resto de las características consideradas más importantes fueron el coste, para garantizar que el euro digital pudiera ser gratuito para las personas físicas, la interoperabilidad con el panorama de pagos digitales ya existente y la inclusión financiera de la población no bancarizada.

El Informe sobre la consulta pública también proporcionó información relevante sobre el diseño final del euro digital, ya que se abordaron directamente las medidas contra el blanqueo de capitales (AML) y la lucha contra la financiación del terrorismo (CFT), así como las limitaciones del euro digital como inversión. Los encuestados tuvieron la oportunidad de materializar sus preocupaciones en relación con estas limitaciones, reafirmando su preferencia por un euro digital con funcionalidades similares a las del dinero en efectivo, rentable en comparación con otros métodos de pago existentes, y de fácil acceso y utilización, aunque ello supusiera tener que soportar ciertas limitaciones.

B.3.3 Etapas de desarrollo

Tras la publicación del Informe sobre la consulta pública, el Eurosistema confirmó el lanzamiento oficial del proyecto del euro digital en julio de 2021. Inicialmente se consideró que la primera etapa, la fase de investigación, duraría 24 meses, mientras el Banco Central Europeo se centraba en las preferencias de los usuarios de cara al diseño final de la manifestación digital de la moneda única. Esta fase se caracterizó por la publicación por parte del Banco Central Europeo de un informe sobre las nuevas tendencias en los pagos digitales en marzo de 2022, y cuatro informes sobre los progresos realizados en la fase de investigación: dos en 2022, en septiembre y diciembre, y dos en 2023, en abril y julio. Estos informes ponían de manifiesto el interés de la Unión Europea por analizar todas las características relevantes del posible CBDC que se implantaría en la zona euro, previendo la introducción de una propuesta para establecer el euro

digital. Además, en noviembre de 2022, el Banco Central Europeo organizó, junto con la Comisión Europea, una conferencia sobre el euro digital titulada "Hacia un marco legislativo para un euro digital". Esta conferencia permitió a los responsables políticos y a las partes interesadas debatir los aspectos normativos clave de un euro digital. Por último, como conclusión de la fase de investigación, en octubre de 2023 se publicó un resumen, en el que se recogían todas las nociones pertinentes ya presentadas en las cuatro anteriores, en consonancia con el contenido de la Propuesta sobre el establecimiento del euro digital recientemente presentada.

B.3.4 Propuesta de Reglamento del Parlamento Europeo y del Consejo sobre la creación del euro digital

El 28 de junio de 2023, la Comisión Europea dio a conocer la Propuesta sobre el establecimiento del euro digital como parte del paquete legislativo para establecer un marco para un euro digital, garantizando al mismo tiempo el curso legal de los billetes y monedas físicos en euros en toda la zona del euro, salvaguardando el papel esencial del dinero del banco central dentro de la zona del euro. El diseño final considerado para el euro digital respondía a las preocupaciones de la población señaladas en el informe sobre la consulta pública de 2021, al tiempo que respaldaba sus opciones en los cuatro informes sobre la fase de investigación de 2022 y 2023.

Con la publicación de la Propuesta, el diseño final del euro digital puede ser abordado y analizado desde una perspectiva jurídica, permitiendo el estudio de sus disposiciones para determinar si las preocupaciones de la población han sido efectivamente mitigadas. Para ello, en el siguiente subapartado se aborda la arquitectura y principales características del euro digital como CBDC, con una breve descripción de la estructura de la Propuesta en el subapartado posterior. De este modo, el análisis de la Propuesta en esta Tesis puede realizarse adecuadamente en su contexto jurídico relativo a la tecnología empleada para la emisión del euro digital y al acto jurídico que la autoriza.

B.3.4.1 ¿Por qué un euro digital en la forma descrita en la Propuesta?

El euro digital es una moneda digital del banco central cuyo objetivo es proporcionar un medio de pago digital público y gratuito a los residentes en la zona del euro, en consonancia con las necesidades y preocupaciones de la población de la Unión Europea

manifestadas en el Informe sobre la consulta pública de 2021. Tal y como se describe en la Propuesta, el euro digital ha sido diseñado para funcionar como un CBDC híbrido, basado en cuentas y de uso minorista, que funciona en una infraestructura de liquidación convencional basada en la tecnología TARGET Instant Payment Settlement (TIPS). Esto significa que el euro digital pretende proporcionar algunas de las ventajas asociadas a la implantación de una moneda digital de banco central, a saber, reducir la dependencia de la población de los medios de pago privados, garantizando al mismo tiempo que los proveedores de servicios de pago sigan siendo el centro de toda transacción, ya que han sido incluidos como intermediarios esenciales, procesando toda operación de pago en euros digitales, a pesar de que la manifestación digital de la moneda única es un derecho directo frente al Banco Central Europeo, que no procesa las transacciones. En resumen, en comparación con otros medios de pago digitales comparables proporcionados por agentes privados, el euro digital garantiza la aceptación obligatoria, mayor privacidad, y un instrumento financiero sin riesgos que se proporciona sin coste alguno para las personas físicas.

Sin embargo, a pesar de los esfuerzos de las autoridades implicadas en su desarrollo, los ciudadanos de la Unión Europea siguen mostrándose reacios a la implantación del euro digital. Encuestas recientes han mostrado una reducción del porcentaje de ciudadanos dispuestos a utilizar el euro digital como complemento de los medios de pago ya existentes, especialmente tras la publicación de la Propuesta. El rechazo al euro digital evidencia la necesidad de una revisión en profundidad de la Propuesta que contemple mejoras que se ajusten adecuadamente a las preferencias de sus futuros usuarios.

B.3.4.2 Análisis estructural de la Propuesta

La Propuesta para el establecimiento del euro digital , tal como se publicó por primera vez el 28 de junio de 2023, incluye 85 considerandos, 42 artículos y 5 anexos, estando los artículos estructurados en diez capítulos. Además, como es habitual, la Propuesta va acompañada de una exposición de motivos en la que se facilita información pertinente sobre determinadas opciones de diseño adoptadas para el euro digital. A continuación se aborda una breve descripción de la estructura de la Propuesta, tal como se ha descrito.

En cuanto al contenido jurídico de la Propuesta, el Capítulo I, titulado "Objeto y definiciones", incluye los artículos 1 y 2, abordando el contenido anunciado en su título

como era de esperar. Dicho Capítulo establece el alcance y contenido de la Propuesta, al tiempo que asegura una adecuada definición de las categorías relevantes consideradas en sus disposiciones. Por su parte, el Capítulo II , titulado "Instauración y emisión del euro digital", incluye los artículos 3 a 6 y hace referencia a la naturaleza del euro digital como forma digital de la moneda única en la zona euro, a la autoridad del Banco Central Europeo para su emisión y a la legislación aplicable y autoridades competentes implicadas en el establecimiento y posterior control del euro digital. Estos dos primeros capítulos establecen el marco jurídico básico de aplicación, además de la propia Propuesta, para la emisión del euro digital.

El Capítulo III de la Propuesta, titulado "Curso legal", incluye los artículos 7 a 12. En este capítulo se analiza el curso legal del euro digital, una vez emitido, y las limitaciones, ya sean territoriales, basadas en consideraciones personales del ordenante y del beneficiario, o basadas en la naturaleza del derecho monetario, del principio de aceptación obligatoria para la manifestación digital del euro. Además, se aborda la interacción entre el euro digital y su contrapartida física, garantizando su convertibilidad con los billetes y monedas en euros a la par.

Más adelante en la Propuesta, el Capítulo IV, titulado "Distribución", incluye los artículos 13 y 14. Este capítulo determina las condiciones iniciales para la distribución del euro digital en la zona del euro y establece las consideraciones pertinentes para acceder a los servicios del euro digital, tales como el requisito de que determinados proveedores de servicios de pago, a saber, las entidades de crédito, presten gratuitamente los servicios básicos de pago en euros digitales, tal como se considera más adelante en la Propuesta.

Por su parte, el Capítulo V de la Propuesta, titulado "Uso del euro digital como reserva de valor y como medio de pago", incluye los artículos 15 a 17. Mientras que el primero de estos artículos establece los principios básicos que permiten la utilización del euro digital como depósito de valor y como medio de pago, los otros dos incluyen limitaciones que restringen cada una de las características, respectivamente, al tiempo que permiten sistemas de control adecuados para garantizar que el euro digital sea fácilmente accesible por los posibles usuarios y no se vea perjudicado por los proveedores de servicios de pago en favor de medios de pago comparables de propiedad privada.

El Capítulo VI de la Propuesta, titulado "Distribución del euro digital fuera de la zona del euro", incluye los artículos 18 a 21. De forma similar al Capítulo IV de la Propuesta, el

legislador europeo ha abordado aquí las condiciones para la distribución del euro digital, considerando esta vez los requisitos para la autorización de dicha distribución en Estados miembros cuya moneda no es el euro, terceros países fuera de la Unión Europea, así como la consideración especial relativa a terceros países bajo un acuerdo monetario con la Unión. Por último, se aborda la posibilidad de habilitar pagos cruzados con Estados miembros cuya moneda no es el euro, aunque sólo como una actuación condicionada de las autoridades monetarias implicadas que tendría lugar tras la emisión del euro digital.

El Capítulo VII de la Propuesta, titulado "Características técnicas", presenta una estructura diferente, conteniendo dos secciones distintas. Su primera sección, titulada "Funcionalidades del euro digital", incluye los artículos 22 a 24 y hace referencia a características del euro digital tales como la accesibilidad y el uso, las modalidades en línea y fuera de línea del euro digital y la posibilidad de aplicar operaciones de pago en euros digitales condicionales. Por su parte, la segunda sección, titulada "Modalidades de distribución", incluye los artículos 25 a 33 y aborda consideraciones técnicas sobre la emisión del euro digital, como los servicios front-end para acceder y utilizar el euro digital, la interoperabilidad prevista, los mecanismos de resolución de litigios y prevención del fraude, el cumplimiento de las sanciones emanadas de la Unión Europea, el cambio urgente de un proveedor de servicios de pago a otro y la inclusión digital de los posibles usuarios del euro digital.

El Capítulo VIII de la Propuesta, titulado "Privacidad y protección de datos", incluye los artículos 34 a 36. Este capítulo aborda los fines lícitos para los que los proveedores de servicios de pago, el Banco Central Europeo y los bancos centrales nacionales, y los proveedores de servicios de apoyo pueden procesar datos con respecto a las operaciones de pago digitales en euros, limitando los tipos de datos personales que pueden recopilar y procesar. Íntimamente asociado al tema de la privacidad, el Capítulo IX de la Propuesta, titulado "Lucha contra el blanqueo de capitales", sólo incluye el artículo 37, en el que el legislador europeo aborda las medidas de lucha contra el blanqueo de capitales y la financiación del terrorismo que se aplican específicamente a las operaciones digitales de pago en euros fuera de línea.

Por último, el Capítulo X de la Propuesta, titulado "Disposiciones finales", incluye los artículos 38 a 42, y aborda los procedimientos pertinentes en relación con otras disposiciones de la Propuesta, como la facultad de adoptar actos delegados de la Comisión

Europea, el mandato al Banco Central Europeo de presentar informes sobre la adopción y utilización del euro digital una vez que se emita por primera vez y la entrada en vigor del Reglamento una vez que deje de ser una Propuesta.

Además, la Propuesta incluye 5 anexos diferentes que complementan el contenido de los 10 capítulos mencionados. Así, el Anexo I de la Propuesta, titulado "Servicios digitales de pago en euros", incluye una enumeración de en qué consisten los servicios digitales en euros, en una lista abierta que podrá ser actualizada en el futuro. El Anexo II de la Propuesta, titulado "Servicios digitales básicos de pago en euros", incluye una lista abierta, de nuevo, de los servicios digitales básicos de pago en euros que deben prestar gratuitamente las entidades de crédito a las personas físicas residentes o establecidas en la zona del euro. Por último, los Anexos III , IV , y V de la Propuesta, titulados "Datos personales tratados por proveedores de servicios de pago", "Datos personales tratados por el Banco Central Europeo y los bancos centrales nacionales", y "Datos personales tratados por proveedores de servicios de apoyo", respectivamente, delimitan el tratamiento de datos personales por cada uno de los distintos responsables del tratamiento de los datos considerados.

B.4 Objetivo de esta Tesis

Una vez abordado con detenimiento el contexto existente en el panorama de los pagos digitales y la necesidad concreta de la implantación de una moneda digital de banco central, el euro digital, en la Unión Europea, es preciso presentar el objetivo de este estudio. Teniendo en cuenta lo anterior, el objetivo principal de esta tesis es proporcionar adecuadamente una revisión de la estructura jurídica del próximo euro digital, centrándose en aquellos aspectos que plantean una mayor complejidad doctrinal para la academia jurídica y el legislador europeo. Para ello, en los próximos capítulos de esta obra se presenta un profundo análisis de la Propuesta de creación del euro digital.

Es de suma importancia proporcionar a las autoridades de la Unión Europea un análisis doctrinal suficiente de todos los aspectos relevantes que la Propuesta conlleva con respecto al diseño final del euro digital. En su fase actual de implementación, el euro digital todavía puede ser mejorado y su diseño adaptado para implementar los cambios que sean necesarios, especialmente después de que la academia jurídica haya identificado

fallos relevantes en su formulación actual tal y como se presenta en la Propuesta. El legislador europeo está analizando actualmente el corpus de análisis jurídico que se está publicando para comprender qué cambios son necesarios y la justificación de los mismos. El momento adecuado para proponer un estudio integrador es ahora, mientras los cambios aún son posibles.

Como se ha expuesto brevemente en el párrafo anterior, el mundo académico jurídico de todo el mundo ha mostrado un gran interés por los temas de las monedas digitales de los bancos centrales, en general, y del euro digital, en particular. Esta nueva manifestación digital del dinero del banco central tiene el potencial de revolucionar el panorama de los pagos digitales, aunque el enfoque óptimo desde una perspectiva jurídica sigue sin estar claro, ya que el euro digital es todavía una de las primeras emisiones disponibles, y muchas autoridades monetarias de todo el mundo esperan esta experiencia para presentar sus propias propuestas legislativas al respecto. Sin embargo, a pesar del interés por el tema, no son muchos los trabajos académicos que han abordado diversas consideraciones incluidas en la Propuesta. Si bien existen numerosos análisis jurídicos que adoptan un enfoque general sobre el concepto de moneda digital de banco central y sus posibles beneficios, no son muchos los estudios que han abordado escenarios concretos que requieran cambios específicos en el marco jurídico vigente, como su distribución o las relaciones jurídicas que pueden surgir entre consumidores, proveedores de servicios de pago y bancos centrales una vez implantada la moneda digital de banco central. Esta cuestión se hace más acuciante cuando se aborda desde la perspectiva específica del euro legal: a pesar del llamamiento de algunos autores, el euro digital podría beneficiarse de un análisis exhaustivo y holístico de su Propuesta, permitiendo el debate en el seno de la academia jurídica europea para aportar propuestas de lege ferenda basadas en el análisis del acto jurídico que se ha publicado.

La implantación del euro digital afectará a varios ámbitos jurídicos de la Unión Europea, como el Derecho civil, el Derecho de los consumidores, el Derecho de la intimidad o el Derecho bancario. Con el fin de proporcionar un apoyo académico adecuado para su emisión, la academia jurídica debe abordar todos los temas relevantes incluidos en la Propuesta y apoyar su diseño final con un análisis adecuado. Sin embargo, este trabajo también pretende orientar a los profanos interesados en el diseño dado al euro digital y en las oportunidades de mejora que aún pueden ser consideradas por la Unión Europea. Con

esta vocación, el trabajo titulado "Estructura jurídica del euro digital" se ha realizado para proporcionar un análisis exhaustivo y profundo de la Propuesta sobre el establecimiento del euro digital que aspira a iniciar un debate jurídico que redunde en un mejor acceso a los pagos digitales en la Unión Europea para todos los ciudadanos, con independencia de sus conocimientos financieros o sus habilidades digitales.

B.5 Metodología

Para alcanzar el objetivo mencionado en este trabajo, la metodología de estudio ha requerido una mayor contextualización del concepto de moneda digital de banco central (CBDC) antes de iniciar el análisis jurídico concreto de la Propuesta sobre el establecimiento del euro digital por dos razones principales. En primer lugar, dado que el concepto de CBDC supone una tecnología bastante novedosa, los autores que han estudiado el fenómeno de su implementación por parte de las autoridades monetarias de todo el mundo han venido contendiendo características esenciales asociadas a su naturaleza, lo que ha requerido una aproximación amplia a la literatura específica sobre el tema desde 2020. En segundo lugar, a pesar de que este trabajo se centra en el análisis jurídico de la citada Propuesta, la Comisión Europea no desveló su contenido hasta finales de junio de 2023. En consecuencia, el análisis jurídico propiamente dicho se ha concentrado en el último año de permanencia en el programa de doctorado que promueve esta Tesis.

Así, la metodología implementada para el desarrollo de este trabajo se ha centrado en una revisión exhaustiva del estado del arte en los temas de pagos digitales, incluyendo las tecnologías relevantes, la liquidación de las operaciones de pago, y el marco legal ya existente en la Unión Europea; las monedas digitales de los bancos centrales, explorando una amplia literatura sobre la contextualización conceptual, así como las arquitecturas y tecnologías disponibles para su implementación; y el euro digital propiamente dicho, centrándose en la Propuesta para su emisión, otros documentos jurídicos relevantes publicados o encargados directamente por el Banco Central Europeo, el Eurosistema o la Comisión Europea, así como en la literatura incipiente que analiza diversos aspectos de su diseño final previsto por el legislador europeo.

También hay que señalar que esta metodología de revisión sistemática de la literatura ha requerido acceder a literatura que va más allá del ámbito de los estudios jurídicos, ya

que también se ha accedido y estudiado documentación técnica y literatura procedente de fuentes y autores económicos para completar el análisis de la próxima implantación del euro digital. Si bien este enfoque se sale de lo habitual, sólo de este modo puede realizarse un análisis exhaustivo de las tecnologías consideradas para la emisión del euro digital. De lo contrario, las definiciones y descripciones jurídicas de los fenómenos asociados a su implantación no podrán captar la realidad que entrañan.

El resultado de esta metodología de trabajo es un estudio sobre la estructura jurídica del euro digital establecida en la Propuesta materializado en forma de análisis holístico de siete capítulos. Además, se ha incluido un apéndice para aportar definiciones y minimizar la complejidad conceptual que pueden aportar algunas categorías consideradas en la Tesis, sentando las bases para un adecuado debate jurídico basado en consideraciones dadas y no en elucubraciones estrictas. Teniendo en cuenta lo anterior, este trabajo se estructura de la siguiente manera: el presente capítulo, contextualiza el marco jurídico de los pagos digitales, aborda las consideraciones esenciales en torno al concepto de moneda digital de banco central e introduce la Propuesta sobre el establecimiento del euro digital. El segundo capítulo repasa el concepto jurídico de dinero e introduce el análisis del Capítulo III de la Propuesta, a saber, el curso legal del euro digital y las limitaciones que pueden surgir al principio de aceptación obligatoria que conlleva. Por su parte, el tercer capítulo repasa el contenido del Capítulo V de la Propuesta, abordando la utilización del euro digital como depósito de valor y medio de pago, determinando el fundamento de las limitaciones introducidas por el legislador europeo. El cuarto capítulo analiza la distribución del euro digital dentro de la zona del euro y fuera de ella, es decir, en los Estados miembros cuya moneda no es el euro y en terceros países, así como la posibilidad de realizar pagos en divisas cruzadas con el euro digital, centrándose en el contenido de los capítulos IV y VI de la Propuesta. El quinto capítulo ofrece un análisis exhaustivo de las características técnicas que se implementarán con la emisión del euro digital, tal y como se presentan en las Secciones 1 y 2 del Capítulo VII de la Propuesta. Además, los temas de la privacidad y la lucha contra el blanqueo de capitales y la financiación del terrorismo se abordan en el sexto capítulo, imitando la introducción de dichos temas en los capítulos VIII y IX de la Propuesta. Por último, el capítulo final de esta Tesis actúa como cierre presentando una visión general del diseño actual del euro digital, los cambios previstos en la versión definitiva del Reglamento sobre el establecimiento del euro digital,

las características clave analizadas en este trabajo y las futuras líneas de investigación que se desprenden de esta Tesis.

Appendix C

Capitolo 7 - Conclusioni

Negli ultimi sei capitoli, la Proposta per l'istituzione dell'euro digitale è stata analizzata a fondo, nel tentativo di individuare le scelte progettuali più rilevanti effettuate dalle autorità dell'Unione Europea nel determinare le caratteristiche della nuova manifestazione digitale della moneta unica.[1] L'obiettivo principale di questo studio, come descritto nel Capitolo 1 della Tesi, è stato quello di fornire un'adeguata rassegna della struttura giuridica del prossimo euro digitale, concentrandosi sugli aspetti che presentano la maggiore complessità dottrinale sia per il mondo accademico del diritto che per il legislatore europeo. Per raggiungere tale obiettivo, il presente studio ha fornito un contesto accademico che giustifica l'attuale disegno della Proposta, disposizione per disposizione, impiegando una metodologia incentrata sul fornire una prospettiva olistica e completa della struttura giuridica proposta per il prossimo euro digitale. L'obiettivo di questo studio è stato quindi quello di raccogliere le conoscenze giuridiche, economiche e tecniche esistenti sul tema delle valute digitali delle banche centrali (CBDC) in generale, e dell'euro digitale in particolare, per creare un lavoro di riferimento su cui altri ricercatori possano basarsi, ampliando l'analisi.

L'analisi giuridica condotta in questa tesi ha contribuito a determinare se le aspettative degli attori rilevanti dell'euro digitale sono state soddisfatte. Mentre gli attori rilevanti nel panorama dei pagamenti digitali, come i prestatori di servizi di pagamento (PSP), hanno visto concretizzate le loro richieste nel testo della proposta, i potenziali utenti dell'euro digitale hanno riconosciuto che alcune delle loro preoccupazioni non sono state gestite con cura, il che ha permesso di discutere se l'euro digitale sia il mezzo di

[1] The footnotes in this chapter have been intentionally left out of the text. The reader is kindly requested to check the references, as needed, in Chapter 7 of the Thesis.

pagamento digitale pubblico di cui i cittadini dell'eurozona hanno bisogno e che meritano. Di conseguenza, si attendono ancora diverse modifiche nel testo finale della proposta, prima che venga ratificata dalla procedura legislativa dell'Unione europea. Sebbene non tutti questi cambiamenti trovino le loro radici nei desideri della popolazione dell'Unione Europea, l'analisi svolta nel Capitolo 2 di questa Tesi incoraggia il legislatore europeo a comprendere le esigenze dei cittadini prima di imporre un mezzo di pagamento che non soddisfa le loro aspettative in termini di usabilità o privacy delle transazioni.

Inoltre, questo studio ha contribuito a identificare le caratteristiche essenziali del prossimo euro digitale, esplorando le conseguenze che si prospettano nell'adozione da parte degli utenti e i probabili conflitti che potrebbero manifestarsi in futuro, allo stato attuale della proposta. Pertanto, l'analisi condotta in ciascuno dei sei capitoli precedenti è stata concepita per contribuire all'individuazione di difetti nelle disposizioni della Proposta, incoraggiando il legislatore europeo a modificare il testo laddove siano necessari ulteriori chiarimenti o il contenuto della disposizione possa portare a conseguenze indesiderate una volta che sarà definitiva. Tale analisi si è basata su una precedente letteratura pertinente del mondo accademico giuridico europeo, poiché il tema dell'emissione di un euro digitale ha attirato l'attenzione degli studiosi internazionali. Tuttavia, a causa della natura olistica del presente lavoro e della metodologia di analisi impiegata, non tutti i dettagli inclusi nella Proposta sono stati affrontati in modo esaustivo, e si incoraggia un'analisi futura più approfondita per determinare adeguatamente le conseguenze del disegno dell'euro digitale nella sua attuale stesura. Pertanto, le future linee di ricerca, alcune delle quali sono già in fase di elaborazione da parte del gruppo di ricerca di cui fa parte questo autore esordiente, sono identificate per contribuire a questa direzione, nel tentativo di garantire l'implementazione impeccabile di un euro digitale che soddisfi le esigenze di tutti gli stakeholder con un design supportato dalla ricerca accademica.

Tenendo conto di quanto sopra, questo capitolo finale è strutturato come segue: in primo luogo, viene offerta una descrizione di ciò che è, e di ciò che non è nella sua forma attuale, l'euro digitale, determinando se le aspettative preliminari di tutti gli attori rilevanti nel panorama dei pagamenti digitali, in particolare i PSP e i futuri utenti dell'euro digitale, sono state adeguatamente soddisfatte. In secondo luogo, viene presentato un catalogo delle modifiche previste nel testo della proposta, per determinare quali saranno i miglioramenti da apportare alla versione finale dell'imminente regolamento

per l'introduzione dell'euro digitale. In terzo luogo, viene offerta una descrizione delle caratteristiche principali dell'euro digitale analizzate in questa tesi, seguendo la struttura dei capitoli presentati, che imita in qualche modo la struttura della Proposta. Infine, si elencano i limiti del presente studio e si propongono linee di ricerca future basate su di essi.

C.1 Aspettative sulla emissione prevista dell'euro digitale.

Da quando, nell'ottobre 2020, la Banca Centrale Europea ha affrontato l'approccio iniziale alla creazione e all'emissione dell'euro digitale, il progetto del CBDC dell'Unione Europea ha visto cambiare le sue caratteristiche nel tempo. Come già illustrato nel Capitolo 1 della Tesi, l'euro digitale è stato originariamente concepito per integrare il ruolo della moneta della banca centrale nella sua forma fisica, consentendo alla popolazione di accedere ai pagamenti digitali con un'alternativa pubblica non soggetta agli interessi di soggetti privati. In questo modo, l'euro digitale è stato garantito per introdurre diversi vantaggi nel sistema dei pagamenti digitali, promuovendo l'inclusione finanziaria per la popolazione non bancaria, nonché caratteristiche di accessibilità per coloro che necessitano di inclusione digitale, e sostenendo la trasmissione della politica monetaria della Banca Centrale Europea. Tutto questo tenendo conto delle esigenze e delle preferenze degli utenti, come la facilità d'uso e l'accessibilità, con l'interoperabilità essenziale, la privacy e la protezione dei dati, introducendo la tensione tra tracciabilità e desiderio di anonimizzazione, nonché la sicurezza delle transazioni. Queste preferenze, ratificate dai cittadini dell'Unione europea nel 2021, dovevano diventare le caratteristiche fondamentali dell'euro digitale, ma il progetto finale incluso nella Proposta potrebbe non essere completamente allineato con esse, in particolare per quanto riguarda la privacy nelle transazioni di pagamento.

Uno dei contributi di questo lavoro è stata l'adeguata identificazione di cosa sia l'euro digitale come descritto nei 42 articoli della Proposta, a differenza di quanto descritto in precedenza dalle autorità dell'Unione europea in una documentazione non vincolante. Pertanto, la prossima sottosezione contribuisce a chiarire cosa i potenziali utenti dell'euro digitale possono ragionevolmente aspettarsi dall'emissione del CBDC.

C.1.1 Cosa è l'euro digitale proposto e cosa non lo è?

Come descritto in precedenza nel Capitolo 1 della tesi, l'euro digitale è stato progettato per funzionare come un CBDC ibrido, basato su un conto, che funziona in un'infrastruttura di regolamento convenzionale basata sulla tecnologia TARGET Instant Payment Settlement (TIPS). Le scelte operate dal legislatore europeo in tal senso sono state meticolosamente definite dall'obiettivo principale che si prefigge l'implementazione dell'euro digitale, ovvero consentirne l'utilizzo a un ampio settore della popolazione dell'Unione europea. L'euro digitale sarà quindi un mezzo di pagamento pubblico che consentirà ai cittadini della zona euro di accedere a una manifestazione digitale della moneta della banca centrale per le operazioni di pagamento online e offline. Inoltre, la Proposta ha stabilito diverse caratteristiche relative alla sua accessibilità e al suo utilizzo, assicurando che ogni potenziale utente all'interno dell'ambito territoriale della Proposta, , potrà effettuare facilmente operazioni di pagamento utilizzando il proprio conto di pagamento in euro digitale. Infine, il legislatore europeo ha fatto in modo che l'euro digitale tuteli la privacy dei suoi utenti meglio dei mezzi di pagamento digitali alternativi creati da soggetti privati, fornendo al contempo alle autorità e alla magistratura informazioni sufficienti per prevenire il riciclaggio di denaro e il finanziamento del terrorismo. Nel complesso, l'euro digitale è stato progettato per offrire un mezzo di pagamento migliore alla popolazione dell'Unione europea, fornendo miglioramenti marginali rispetto alla tecnologia esistente disponibile per i pagamenti digitali.

Tuttavia, determinare cosa non è l'euro digitale, secondo le disposizioni della Proposta, potrebbe essere più rivelatore per la sua analisi, poiché fornisce un contesto rilevante sulla portata del progresso tecnologico che sarà realizzato con la sua implementazione. Pertanto, l'euro digitale non può essere equiparato a nessuna forma di cripto-asset funzionante in un'infrastruttura di regolamento basata su DLT, non è equivalente a un conto bancario pubblico né a uno strumento finanziario fruttifero, non può fungere da moneta programmabile, e migliora appena il livello di privacy fornito da mezzi di pagamento equivalenti di proprietà privata. In definitiva, l'euro digitale non è né una manifestazione inedita della tecnologia né una rivoluzione rivoluzionaria per il sistema finanziario, nonostante il potenziale dei CBDC in questo senso.

È difficile non pensare che l'implementazione dell'euro digitale, così come concepita dalla proposta, sia un'occasione mancata per migliorare la posizione dei consumatori

nell'Unione europea e per promuovere un'intermediazione dei servizi finanziari più equa. Sebbene sia ragionevole comprendere che l'implementazione di un euro digitale che includa alcune delle caratteristiche descritte nel paragrafo precedente finirebbe per provocare una competizione indesiderata con le banche commerciali che potrebbe mettere a repentaglio il sistema finanziario nel suo complesso, lo strumento risultante non ha garanzie di successo nonostante sia necessario per le abitudini di pagamento dei consumatori di oggi. Il legislatore europeo è incoraggiato a rivedere la portata della Proposta per determinare se sia consigliabile procedere con l'implementazione dell'euro digitale così come è attualmente concepito, considerando il rischio di emettere la nuova manifestazione digitale della moneta unica solo per vedere come viene trascurata dalla popolazione dell'Unione Europea.

C.2 Modifiche previste nella proposta prima della pubblicazione del regolamento definitivo

L'esame approfondito della Proposta effettuato nella Tesi ha permesso di individuare le modifiche più rilevanti che si prevede di apportare alle sue disposizioni nella versione definitiva del testo. Mentre alcune di queste modifiche previste trovano la loro ragion d'essere in meri errori di stampa o in riferimenti a versioni precedenti, non ancora viste, della Proposta, altre si basano su considerazioni legali portate dalla Banca Centrale Europea o dal mondo accademico legale. Questa sezione enumera queste modifiche e ne cita le motivazioni, come già affrontato nei precedenti sei capitoli della tesi.

C.2.1 Modifiche al Capitolo III ("Corso legale")

Come si è visto nel Capitolo 2 della Tesi, il legislatore europeo è incoraggiato a prendere in considerazione un emendamento minore all'Articolo 9 della Proposta. Da un punto di vista strutturale, non c'è alcuna giustificazione per la collocazione della disposizione finale dell'articolo 9, poiché essa riguarda solo la lettera b) di tale articolo, come espressamente stabilito. Pertanto, avrebbe potuto essere inserita dopo l'ultima frase di tale lettera, migliorando la leggibilità della disposizione. Analogamente, la lettera c) dell'articolo 9 della Proposta contiene un riferimento alle "attività personali o domestiche". Come già detto in precedenza, nonostante sia stato trattato nel Considerando (18) della Proposta,

queste attività non sono descritte da nessuna parte nel testo. A causa delle sue implicazioni, il legislatore europeo è incoraggiato a fornire una definizione nella versione definitiva della Proposta.

In termini di definizioni mancanti, anche l'articolo 11 della Proposta potrebbe beneficiare dell'inserimento di un'altra. Le "eccezioni di natura monetaria" incluse in tale disposizione, nonostante siano trattate brevemente nel Considerando (19), non sono descritte da nessuna parte nella Proposta, il che porta all'impossibilità di capire in anticipo in quali circostanze sarebbe possibile introdurre nuove eccezioni al principio dell'accettazione obbligatoria dell'euro digitale.

C.2.2 Modifiche al Capitolo IV ("Distribuzione")

Le modifiche previste per il Capitolo IV della Proposta riguardano l'inserimento di definizioni corrette per diversi concetti che sono citati nel testo, ma che mancano di una definizione adeguata che garantisca la categorizzazione delle loro implicazioni. Così, mentre la Proposta definisce adeguatamente il "costo del servizio dell'esercente", non vi è alcuna definizione per la "commissione inter-PSP", nonostante siano trattati insieme nella Proposta. Per motivi di chiarezza, si invita il legislatore europeo a considerare l'inserimento di una definizione anche per quest'ultima.

Da parte sua, il legislatore europeo è tenuto a garantire la chiarezza quando affronta i temi dell'inclusione digitale e finanziaria, dal momento che i due concetti sono affrontati insieme nel testo e vengono citati per errore in modo indistinto. Poiché i due concetti fanno riferimento a diversi scenari indesiderati, il sito offre definizioni separate che potrebbero migliorare la capacità del lettore di affrontarli di conseguenza. Inoltre, il legislatore europeo è invitato a unificare correttamente tre diverse categorie, anch'esse elencate nel testo. Nel tentativo di unificare i concetti, nel considerando (5) della proposta sono elencate fino a tre diverse categorie: "unbanked", "underbanked" e popolazione "offline". Mentre le prime due si riferiscono chiaramente alla stessa realtà, la "popolazione offline" non si riferisce solo a un settore della popolazione incapace di accedere all'intermediazione finanziaria, ma anche a un settore della popolazione che ha difficoltà con la tecnologia. Pertanto, le prime due categorie appartengono all'inclusione finanziaria, mentre la terza si riferisce all'inclusione digitale.

C.2.3 Modifiche al Capitolo V ("Uso dell'euro digitale come riserva di valore e come mezzo di pagamento")

Il Capitolo V della Proposta include le modifiche più previste a causa della natura delle sue disposizioni, che riguardano l'uso dell'euro digitale come riserva di valore e come mezzo di pagamento, che sono state drasticamente regolamentate per evitare una concorrenza indesiderata con le banche commerciali. Di conseguenza, la natura di queste modifiche previste va oltre l'assenza di definizioni, come avviene in altri capitoli, e si concentra su modifiche specifiche nel testo della proposta riguardanti l'attuazione dei limiti di detenzione per i conti di pagamento in euro digitali.

Pertanto, il contenuto dell'articolo 16 della proposta è contestato per diverse ragioni. In primo luogo, il testo della Proposta suggerisce che la definizione di limiti all'euro digitale sia una caratteristica facoltativa, mentre la Banca Centrale Europea è tenuta a sviluppare strumenti per limitare l'uso dell'euro digitale come riserva di valore, cosa che l'autorità monetaria ha criticato in quanto sembra essere incompatibile. In secondo luogo, la convenzione di denominazione utilizzata dalla Commissione europea nella proposta per ciascuno dei limiti considerati in questa disposizione può essere considerata confusa, soprattutto quando non vengono fornite definizioni per ciascuna delle categorie. In terzo luogo, l'idea di imporre gli stessi limiti di detenzione in ogni Stato membro può ostacolare la distribuzione dell'euro digitale e la sua accettazione e l'uso effettivo in tutta l'area dell'euro, poiché un limite di detenzione comune può avere implicazioni diverse per la popolazione di ogni Stato membro.

Considerando la natura specifica dei limiti di detenzione di euro digitali offline, la proposta non affronta la questione se sia possibile detenere euro digitali offline in diversi dispositivi di proprietà dell'utente. Dal momento che potrebbe essere possibile, la proposta dovrebbe affrontare questa possibilità, o respingerla del tutto, al fine di determinare gli effetti sul regolamento delle operazioni di pagamento in euro digitali e sulla sicurezza, in quanto potrebbe diventare impraticabile per gli utenti di euro digitali con accesso limitato a Internet che condividono un conto di pagamento in euro digitali. Il legislatore europeo è incoraggiato a condurre un'analisi approfondita di casi d'uso speciali come questo, per garantire che il progetto finale dell'euro digitale non trascuri settori specifici della popolazione. Allo stesso modo, l'attuale definizione dei limiti di detenzione

quando si considerano i conti multipli posseduti da un utente dell'euro digitale, o un conto di pagamento in euro digitale posseduto da più utenti, può consentire sfruttamenti indesiderati da parte di potenziali utenti dell'euro digitale, come descritto nel Capitolo 3 della Tesi.

Per quanto riguarda l'uso dell'euro digitale come mezzo di pagamento, nonostante l'esplicita inclusione di servizi di pagamento in euro digitali di base, che dovrebbero essere gratuiti per le persone fisiche, il testo della proposta non garantisce che le caratteristiche essenziali, come le funzionalità di finanziamento e di defunding automatizzati, possano essere fornite gratuitamente, il che potrebbe scoraggiare l'adozione dell'euro digitale. La Banca centrale europea ha chiesto al legislatore europeo di rivedere questo aspetto e di aggiornare il testo della proposta in tal senso.

Inoltre, la Banca centrale europea ha richiamato l'attenzione del legislatore europeo su altri due punti della proposta. In primo luogo, nonostante la proposta preveda di determinare l'importo massimo delle commissioni a carico degli esercenti e delle commissioni inter-PSP, la Banca Centrale Europea ha sottolineato di non avere l'autorità necessaria per farlo. Pertanto, se l'autorità monetaria dovesse pubblicare tali importi, non potrebbe essere considerata una determinazione de jure condendo. Se una parte interessata dovesse contestarli e sottoporli a un controllo giudiziario, potrebbe essere concesso un ricorso per annullamento, mettendo a repentaglio gli obiettivi associati a tale pubblicazione. In secondo luogo, la Banca Centrale Europea ha incoraggiato il legislatore europeo a determinare cosa sia "un gruppo rappresentativo" di PSP, come richiesto nell'articolo 17 della proposta. Entrambe le circostanze raccomandano al legislatore europeo di apportare modifiche al testo della proposta per risolvere le difficoltà evidenziate dall'autorità monetaria.

C.2.4 Modifiche al Capitolo VI ("Distribuzione dell'euro digitale al di fuori della zona euro")

Per quanto riguarda il Capitolo VI della Proposta, le modifiche previste includono miglioramenti alla struttura degli articoli 19 e 21 per consentire una più facile comprensione del contenuto di tali disposizioni. Pertanto, come già individuato nel Capitolo 4 della Tesi, la struttura scelta dal legislatore europeo per l'articolo 19, e in particolare per i suoi punti 3 e 4, potrebbe confondere il lettore. Nonostante si possa sostenere che il lettore

possa comunque dedurre le conseguenze leggendo complessivamente sia il punto 3 che il punto 4, è piuttosto improbabile che l'Unione Europea firmi un accordo con un Paese terzo che è già stato identificato come problematico in termini di misure antiriciclaggio e di lotta al finanziamento del terrorismo, per cui si incoraggia una riformulazione.

Da parte sua, il contenuto dell'articolo 21 della Proposta richiede almeno due modifiche. In primo luogo, come si è osservato nell'analisi di tale disposizione nel capitolo 4 della Tesi, la Proposta prevede la possibilità di consentire pagamenti incrociati tra l'euro digitale e altre valute, qualora questi siano oggetto di un accordo preventivo tra la Banca centrale europea e le banche centrali nazionali degli Stati membri la cui moneta non è l'euro "e" i Paesi terzi. Il linguaggio della disposizione utilizza "e" invece di "o". Sebbene il messaggio sia comunque chiaro, l'uso di una congiunzione disgiuntiva è incoraggiato per evitare qualsiasi confusione al lettore, quindi la raccomandazione al legislatore europeo. Inoltre, l'assenza di una definizione per i pagamenti in valute diverse presenta delle difficoltà per il lettore, poiché non si riferiscono alle stesse circostanze dei pagamenti transfrontalieri, per i quali sono state fornite definizioni in altre fonti legislative dell'Unione Europea. Sebbene il concetto non sia di per sé nuovo, una definizione adeguata garantirebbe un futuro allineamento quando l'argomento sarà affrontato dopo la prima emissione dell'euro digitale.

C.2.5 Modifiche al Capitolo VII ("Caratteristiche tecniche")

Le modifiche che si prospettano nel Capo VII della Proposta riguardano principalmente la mancanza di definizioni necessarie o l'assenza di una caratteristica tecnica dell'euro digitale in una delle disposizioni. Tuttavia, il primo requisito per il legislatore europeo riguarda anche il Capo II della Proposta, in quanto l'articolo 27 fa esplicito riferimento alla Seconda Direttiva sui Servizi di Pagamento (PSD2), nonostante l'articolo 5 includa il suo prossimo sostituto, la Terza Direttiva sui Servizi di Pagamento. Il legislatore europeo è incoraggiato ad allineare i riferimenti per evitare complessità al lettore, poiché la legge applicabile deve essere trattata in modo uniforme in tutto il testo.

La proposta richiede ancora una definizione adeguata di "servizi front-end". Pur fornendo una definizione di servizi front-end, la proposta non chiarisce adeguatamente cosa viene regolamentato nell'articolo 28 della proposta. Sebbene il concetto possa essere approssimato all'interfaccia utente che consente agli utenti di accedere a tutti i servizi

dell'euro digitale, come descritto nell'Allegato I della Proposta, l'attuale definizione non soddisfa né un operatore tecnico né un utente standard dell'euro digitale, per cui potrebbe essere incoraggiata una revisione, poiché, così com'è scritta al momento, non riesce a rappresentare ciò che si intende regolamentare. Inoltre, il legislatore europeo è invitato a rivedere il contenuto dell'articolo 28 della proposta, poiché i PSP che possono utilizzare servizi front-end proprietari potrebbero indurre gli utenti a pensare di aver bisogno di un conto in euro non digitale per utilizzare le funzionalità di waterfall, nonostante ciò non sia il caso secondo la proposta.

Infine, si potrebbe sostenere che la collocazione dell'articolo 29 della proposta non sia ottimale, poiché riguarda un argomento poco tecnico. Se è vero che la disposizione riguarda una verifica tecnica delle limitazioni che i PSP devono effettuare con gli utenti dell'euro digitale, essa è più legata al tema della distribuzione dell'euro digitale e dell'applicazione dei limiti di detenzione, il che potrebbe consigliarne la collocazione in un altro punto della Proposta.

C.2.6 Modifiche al Capitolo VIII ("Vita privata e protezione dei dati")

Per quanto riguarda il Capo VIII della proposta, è necessaria solo una definizione aggiuntiva, poiché il concetto di "punto di accesso unico" di cui all'articolo 35, punto 6, della proposta non è esplicitato da nessuna parte nel testo principale della proposta, né negli allegati. Poiché si tratta di un concetto tecnico che consente alcune caratteristiche di salvaguardia dell'euro digitale, è necessario capire che cosa comporta e quale tecnologia verrebbe utilizzata a tal fine.

Oltre alla definizione mancante, altri due concetti richiedono di essere ulteriormente contestualizzati a causa delle loro implicazioni nell'emissione dell'euro digitale. In primo luogo, l'analisi della contraffazione delle operazioni di pagamento offline in euro digitale non è affrontata da nessuna parte nella Proposta, eppure il legislatore europeo esplicita le sue preoccupazioni nell'Allegato IV, dimostrando che la sua analisi è stata presa in considerazione nella progettazione dell'euro digitale. Un'adeguata analisi tecnica, anche se giuridica, sull'argomento avrebbe dovuto essere inclusa nel Capitolo VII ("Caratteristiche tecniche") della Proposta. In secondo luogo, nel testo della Proposta vi sono diversi riferimenti che alludono all'idea di diversi "tipi" di conto di pagamento in euro digitale, ma non vi sono riferimenti concreti nel testo. Pertanto, il legislatore europeo è invitato

a chiarire se si tratta di una possibilità, e le conseguenze di tale differenziazione, o a migliorare il linguaggio della Proposta per garantire chiarezza al lettore.

C.2.7 g) Modifiche al Capitolo IX ("Lotta al riciclaggio")

Infine, le modifiche previste nel Capitolo IX della Proposta si limitano a definizioni concrete. In particolare, il riferimento alle norme antiriciclaggio (AML) nell'articolo 37 potrebbe essere migliorato con l'inclusione di un riferimento esplicito alla lotta al finanziamento del terrorismo (CFT), dato che è incluso nell'analisi. Poiché altre fonti di diritto primario dell'Unione europea fanno già riferimento a entrambi, si raccomanda di aggiornare il titolo del capitolo e quello dell'articolo. Allo stesso modo, la mancanza di una definizione di dati sulle transazioni e di Unità di Informazione Finanziaria raccomanda al legislatore europeo di fornire un contesto sufficiente. Nel caso del primo, le difficoltà possono derivare dal fatto che i "dati delle transazioni" possono non essere dati personali, il che fa sì che l'analisi giuridica vada oltre la prospettiva della privacy. Nel secondo caso, l'Unità di Informazione Finanziaria non è definita nella Proposta, né nella Direttiva 2015/849 né nella COM/2021/420, come evidenziato nel Capitolo 6 della Tesi. Di conseguenza, non è possibile capire chi faccia parte di tale organismo e quali siano le sue competenze.

Inoltre, il riferimento all'imminente sostituzione della direttiva sul riciclaggio di denaro deve essere adeguatamente riflesso nel testo della proposta. Mentre alcuni riferimenti nella Proposta identificano l'applicazione della COM/2021/423, questo non è incluso nell'articolo 5 della Proposta. Questo comportamento contraddice altri atti legislativi ancora condizionati, come COM/2023/366 final e COM/2023/367 final, che sostituiranno la Direttiva (UE) 2015/2366 (PSD2) una volta entrati in vigore, e che sono inclusi nell'articolo 5 della Proposta. Ciò che risulta difficile è il fatto che la COM/2021/423 è inclusa nell'articolo 6 della Proposta, aumentando la confusione del lettore. È necessario un allineamento tra queste due disposizioni e il Capitolo IX della Proposta.

C.3 Caratteristiche principali analizzate nella tesi

Nei sei capitoli precedenti della tesi è stata fornita un'analisi giuridica dettagliata del contenuto della Proposta, concentrandosi sulle considerazioni che comportano la mag-

giore complessità dottrinale sia per il mondo accademico che per il legislatore europeo. Di conseguenza, il contenuto di ciascun capitolo fornisce informazioni approfondite sull'imminente emissione dell'euro digitale, considerando ciascuno degli argomenti generali trattati nella Proposta. Questa sezione evidenzia gli aspetti chiave che sono stati analizzati in ciascun capitolo della tesi, prestando particolare attenzione alle idee originali emerse dall'analisi della struttura giuridica dell'euro digitale, fornendo così un quadro di riferimento che contribuisce nella stessa direzione del mondo accademico legale, verso una corretta analisi delle conseguenze dell'implementazione dell'euro digitale.

Pertanto, il capitolo di apertura fornisce un'esplorazione approfondita del contesto giuridico in evoluzione che circonda i pagamenti digitali. Il capitolo passa in rassegna le risposte normative dal 2007 a oggi, evidenziando le tappe significative nell'Unione Europea e i cambiamenti nelle politiche per rispondere adeguatamente ai requisiti del commercio elettronico. Viene introdotto il concetto di moneta digitale della banca centrale, con una categorizzazione dettagliata e un'analisi dei vantaggi associati alla sua implementazione, nonché dei casi di utilizzo di una CBDC. Viene inoltre fornito il contesto della proposta sull'istituzione dell'euro digitale, analizzando la sua prima concettualizzazione, le preoccupazioni iniziali della popolazione e il design finale scelto per la manifestazione digitale della moneta unica. Infine, vengono affrontati sia l'obiettivo della tesi, , sia la metodologia utilizzata.

Dal canto suo, il Capitolo 2 della Tesi approfondisce il concetto giuridico di moneta, esaminando come l'euro digitale si inserisca all'interno dei costrutti giuridici esistenti delle tre funzioni della moneta: unità di conto, riserva di valore e mezzo di pagamento. Dopo aver analizzato il contenuto del Capitolo III della Proposta, il capitolo si concentra sul corso legale dell'euro digitale. L'analisi comprende le implicazioni del principio di accettazione obbligatoria, l'obbligo di accettare l'euro digitale al suo pieno valore nominale e la sua capacità di estinguere le obbligazioni. Inoltre, affronta le limitazioni a tale principio di accettazione obbligatoria, nonché l'interazione prevista tra l'euro digitale e le banconote e le monete in euro fisiche.

Il Capitolo 3 della Tesi si concentra sul contenuto del Capitolo V della Proposta, analizzando le funzioni dell'euro digitale sia come riserva di valore che come mezzo di pagamento. Il capitolo esamina i limiti di detenzione proposti per le operazioni di pagamento in euro digitale, che mirano a prevenire un'eccessiva tesaurizzazione da

parte degli utenti dell'euro digitale, garantendo la stabilità finanziaria e prevenendo una concorrenza indesiderata con le banche commerciali. Inoltre, viene analizzata criticamente la scelta progettuale di evitare che l'euro digitale diventi uno strumento finanziario fruttifero, prendendo in considerazione approcci alternativi già presenti nel mondo giuridico europeo. Per quanto riguarda l'uso dell'euro digitale come mezzo di pagamento, viene affrontata l'evidente tensione esistente tra l'accettazione obbligatoria derivante dallo status di moneta a corso legale dell'euro digitale e l'obiettivo delle autorità dell'Unione Europea di rendere l'euro digitale gratuito per le persone fisiche. Infine, questo capitolo analizza anche il sistema di incentivi progettato per regolare le spese per gli esercenti e le commissioni inter-PSP imposte dai PSP, che è adeguatamente progettato per minimizzare i costi nel tempo.

Nel Capitolo 4 della Tesi, si esamina il contenuto dei Capitoli IV e VI della Proposta, concentrandosi sugli utenti dell'euro digitale, sulla distribuzione dell'euro digitale all'interno dell'area dell'euro e sui servizi di pagamento in euro digitale attualmente enunciati nella Proposta. In particolare, vengono presi in considerazione il ruolo dei PSP nella distribuzione dell'euro digitale e le caratteristiche essenziali dei servizi di pagamento in euro digitale, come le funzionalità waterfall e reverse-waterfall. Inoltre, vengono analizzate le considerazioni legali sul rapporto che può nascere tra la Banca centrale europea, i PSP e gli utenti dell'euro digitale. Più avanti nel capitolo, viene studiato l'accesso all'euro digitale all'interno dell'area dell'euro, concentrandosi sulla natura dei servizi di pagamento in euro digitali di base descritti nell'Allegato II della Proposta, la possibile sovrapposizione tra l'euro digitale e un conto bancario di base come descritto nella Direttiva (UE) 2014/92, e il tema dell'inclusione digitale e finanziaria. Infine, viene analizzato l'accesso all'euro digitale al di fuori dell'area dell'euro e la possibilità di abilitare i pagamenti cross-currency all'interno dell'infrastruttura di regolamento dell'euro digitale.

Il Capitolo 5 della Tesi esamina il Capitolo VII della Proposta, concentrandosi sulle caratteristiche tecniche incluse nel progetto finale dell'euro digitale. Vengono quindi presi in considerazione il design e l'accessibilità dell'euro digitale, nonché le differenze esistenti tra le operazioni di pagamento in euro digitali online e offline, con un'analisi aggiuntiva della considerazione specifica per le operazioni di pagamento di prossimità, che possono sfuggire alla categorizzazione regolare inclusa nella Proposta. Le operazioni

di pagamento digitale in euro condizionato sono analizzate a fondo per differenziarle dalla moneta programmabile, come richiesto dal legislatore europeo. In seguito, vengono studiati diversi argomenti tecnici, come l'inclusione esplicita dei Portafogli di Identità Digitale Europea nella Proposta, le considerazioni specifiche per il regolamento delle transazioni di pagamento in euro digitali sia online che offline, i miglioramenti nella rilevazione delle frodi per le transazioni di pagamento in euro digitali online rispetto al quadro normativo esistente, e le difficoltà legate all'implementazione di un sistema che garantisca l'accesso non discriminatorio ai dispositivi mobili per l'utilizzo dell'euro digitale, assicurando al contempo la sicurezza per tutti i partecipanti.

Infine, il Capitolo 6 della Tesi passa in rassegna il contenuto dei Capitoli VIII e IX della Proposta, concentrandosi sulla privacy e sulla protezione dei dati, nonché sulle misure antiriciclaggio e antiterrorismo, nelle operazioni di pagamento digitale in euro. Così, dopo aver fornito un contesto generale della contraddizione esistente tra privacy e pagamenti digitali, vengono analizzati i dati trattati dai PSP, dalla Banca centrale europea, e dai fornitori di servizi di supporto , concentrandosi sulle differenze esistenti tra loro e sui benefici attesi in termini di privacy per i potenziali utenti dell'euro digitale. Per quanto riguarda le misure antiriciclaggio, viene criticata prima la struttura del Capitolo IX della Proposta, e poi il suo contenuto, poiché si concentra esclusivamente sulle operazioni di pagamento offline in euro digitali. Inoltre, poiché l'alternativa proposta per le transazioni offline non può essere considerata ottimale, viene proposto un approccio alternativo all'anonimizzazione. Infine, viene adeguatamente affrontata la motivazione dei limiti alle transazioni e alle partecipazioni che si applicano solo alle operazioni di pagamento digitale in euro offline, chiudendo l'analisi del contenuto della Proposta.

C.4 Limiti di questo studio - Linee di ricerca future

Come si è detto all'inizio di questo capitolo conclusivo della tesi, l'obiettivo di questo studio è stato quello di analizzare la struttura giuridica dell'euro digitale così come si presenta nella Proposta di istituzione. Sebbene tale obiettivo sia di per sé lodevole, l'analisi della Proposta e degli altri atti legislativi pertinenti che sono stati studiati ha dimostrato che l'analisi qui inclusa potrebbe beneficiare di un approccio approfondito che si concentri su alcuni aspetti di grande rilevanza per il mondo accademico legale

che richiedono ancora ulteriori ricerche. Questa sezione finale presenta quindi le idee che sono state evidenziate nel corso della Tesi, in ordine sequenziale, ma che non sono state analizzate in profondità. In ogni caso, questi limiti del presente studio vengono proposti come interessanti linee di ricerca future per i giuristi e gli accademici interessati al progresso scientifico dell'attuazione dell'euro digitale e di altri CBDC in tutto il mondo.

Una meta-analisi della letteratura sui CBDC. Sebbene non tutto ciò che viene considerato nella letteratura specifica sui CBDC possa essere utile per l'analisi giuridica dell'euro digitale, un approccio sistemico a tutta la letteratura esistente, ma rilevante, potrebbe essere d'aiuto per promuovere un'analisi olistica delle caratteristiche che potrebbero essere state trascurate nell'analisi presentata in questa tesi. In questo modo, si sarebbe potuto effettuare uno studio più completo ed esaustivo per supportare, o contrastare, qualsiasi decisione presa dal legislatore europeo nella Proposta, con il risultato di migliorare il design finale dell'euro digitale una volta entrato in vigore il regolamento. Un'analisi sistematica come quella descritta potrebbe consentire di studiare ogni dettaglio dell'euro digitale, generando informazioni rilevanti per le autorità dell'Unione europea al fine di migliorare l'attuale contenuto della Proposta, considerando miglioramenti e alternative che vadano oltre i suggerimenti minori descritti in questo studio.

Analisi degli altri progetti CBDC in corso nel mondo. In modo analogo, anche l'analisi di altri progetti CBDC attualmente in fase di studio in tutto il mondo potrebbe produrre benefici simili per l'euro digitale. Secondo il tracker CBDC e la Banca dei Regolamenti Internazionali (BRI) ci sono attualmente più di 40 progetti CBDC già in fase pilota, con oltre 80 autorità monetarie in tutto il mondo che stanno considerando l'emissione di una CBDC. Un'analisi integrativa di tutti questi progetti, incentrata sulle implicazioni legali da una prospettiva generale, potrebbe portare a conclusioni importanti che potrebbero migliorare l'imminente attuazione dell'euro digitale, in quanto sarebbe supportata dall'esperienza di tutte le autorità monetarie interessate e dei principali partner globali coinvolti nei progetti CBDC.

Oltre agli effetti positivi che questa analisi può apportare al mondo accademico giuridico che studia l'emissione dei CBDC in generale, e dell'euro digitale in particolare, anche la progettazione di standard legali per la tecnologia da implementare potrebbe diventare più rapida. In linea con lavori come quello di Sethaput et al. (2023), un'analisi comparativa delle diverse architetture per un CBDC può essere d'aiuto ai legislatori nel

determinare la tecnologia da utilizzare, in quanto sarebbero in grado di affrontare in anticipo le implicazioni legali di una determinata scelta.

Analisi costi-benefici dell'emissione dell'euro digitale. Sebbene il concetto di signoraggio sia stato affrontato nel Capitolo 2 della tesi, la sua analisi si è limitata a introdurre il concetto, ma ulteriori ricerche su questo argomento potrebbero migliorare l'emissione dell'euro digitale. Grazie a questo concetto, è noto che il costo dell'emissione di una moneta può essere calcolato tecnicamente. Allo stesso modo, è possibile determinare i costi teorici associati all'emissione dell'euro digitale, ossia i costi associati all'emissione, alla manutenzione dell'infrastruttura di regolamento e ad altri costi indiretti che possono essere impliciti nel testo legale che ne sancisce l'emissione. È possibile effettuare un'analisi economica diretta per determinare l'utilità derivante dalla sua implementazione. Ciò non solo consentirebbe una stima appropriata dei costi utilizzabili dalle autorità dell'Unione europea, ma permetterebbe anche al legislatore europeo di accertare adeguatamente il livello di utilità associato a ciascuna delle funzionalità dell'euro digitale da una prospettiva microeconomica, consentendo di concentrarsi sulle caratteristiche rilevanti per i futuri utenti dell'euro digitale e di reindirizzare la quantità minima di risorse alle altre che, pur essendo necessarie a causa di diverse implicazioni legali, non sono essenziali per la maggior parte dei potenziali stakeholder dell'euro digitale.

Un quadro teorico adeguato per il concetto di denaro. Il concetto di denaro è stato affrontato nel Capitolo 2 della Tesi nel tentativo di ridurre la sua esistenza giuridica a tre caratteristiche fondamentali che il mondo giuridico ha identificato come il nucleo essenziale di ciò che costituisce il denaro. Tuttavia, nello stesso capitolo, questa analisi autoconclusiva è stata criticata perché trascura l'intrinseca natura sociale del denaro e l'impossibilità di affrontare la sua esistenza senza considerare altre aree di conoscenza, ovvero l'economia, la politica e la sociologia. Di conseguenza, l'analisi della considerazione giuridica dell'euro digitale come denaro, pur non essendo scorretta, permette di trarre solo conclusioni futili: l'euro digitale è denaro perché un atto legislativo, debitamente emanato, gli conferisce il corso legale.

La critica contenuta nel Capitolo 2 della Tesi mira ad avviare il dibattito tra il mondo accademico giuridico per lo sviluppo di un approccio multidisciplinare che permetta di spiegare meglio ciò che fa sì che un determinato bene sia considerato denaro, al di là dell'approccio giuridico classico basato sulle tre funzioni del denaro. Come proposto,

l'approccio olistico che consente la teoria dei sistemi sembra un punto di partenza adeguato, in quanto è stato in grado di agire come quadro teorico per le discipline in cui i sistemi complessi sono la norma. Analizzare il concetto di denaro in questo quadro teorico è di per sé una linea di ricerca di ampio respiro che, nonostante la sua enorme importanza, richiede un livello di studio e di attenzione superiore a quello possibile in un lavoro come il presente, finalizzato all'analisi giuridica di una Proposta di Regolamento dell'Unione Europea.

Analisi approfondita degli scenari relativi alla Proposta sul corso legale delle banconote e delle monete in euro. Il capitolo 2 della tesi affronta diverse apparenti contraddizioni che potrebbero manifestarsi in merito al corso legale dell'euro digitale e delle banconote e monete in euro. Un'analisi approfondita delle apparenti contraddizioni dovrebbe essere condotta per supportare il compito del regolatore europeo nel progettare le implicazioni del corso legale dell'euro fisico e di quello digitale, nonché la loro prevista interazione. Nonostante sia stato sottolineato nella Tesi, lanciando una cautela preventiva al legislatore europeo, la complessità di questo argomento raccomanda di studiare le conseguenze legali delle attuali considerazioni sul corso legale per garantire un'interazione fluida tra entrambe le manifestazioni, fisica e digitale, della moneta unica.

Analisi dei pagamenti tra valute nel Capitolo 4 della Tesi. Questo argomento richiede un'analisi più approfondita di quella presentata in questa tesi, in quanto richiede un'analisi sia tecnica che legale dello stato attuale degli standard tecnologici coinvolti e del quadro giuridico applicabile. Sebbene non sia il momento di fornire un'analisi di questo tipo, poiché il focus di questo lavoro deve essere la Proposta e ciò che comporta l'implementazione dell'euro digitale, la predisposizione di un quadro giuridico adeguato per la probabile implementazione dei pagamenti cross-currency nell'infrastruttura di regolamento dell'euro digitale una volta emesso raccomanda di farlo. Una futura linea di ricerca su questo tema potrebbe procedere in questa direzione, supportando direttamente i compiti delle autorità dell'Unione Europea, in particolare della Banca Centrale Europea, nel determinare l'adeguato disegno legale di tale implementazione.

Determinazione di limiti di detenzione uniformi all'interno della zona euro e tra gli Stati membri la cui moneta non è l'euro. La Proposta ha stabilito che i limiti di detenzione dell'euro digitale devono essere uniformi tra gli Stati membri la cui moneta è l'euro, nonché tra gli Stati membri la cui moneta non è l'euro, nel caso

in cui la distribuzione dell'euro digitale in tali Stati membri sia autorizzata in futuro. Sebbene questo argomento sia stato introdotto nella Tesi, potrebbe trarre beneficio da un'analisi empirica che utilizzi dati macroeconomici e consideri la propensione di ciascuno Stato membro a utilizzare l'euro digitale come mezzo di pagamento, nonché le questioni specifiche relative al riciclaggio di denaro e al finanziamento del terrorismo che un determinato Stato membro potrebbe trovarsi ad affrontare, dal momento che non sono omogenei. Questa linea di ricerca raccomanda di effettuare un'analisi economica per definire efficacemente un limite di detenzione ottimale per ogni Stato membro, soggetto a modifiche che tengano conto degli obiettivi di adozione stabiliti dalle autorità dell'Unione europea e di altre preoccupazioni come le misure antiriciclaggio e antiterrorismo. Poiché questo limite di detenzione specifico per ogni Stato membro sarebbe in contrasto con le disposizioni attualmente in vigore nella Proposta, è necessaria un'analisi adeguata per dimostrare l'attuazione raccomandata, al fine di sostenere la modifica legale quando giustificata al legislatore europeo.

Inclusione finanziaria e digitale. Sebbene questo argomento sia stato ampiamente affrontato nei capitoli 4 e 5 della Tesi, l'analisi fornita non è sufficiente a fornire un'alternativa ben formulata ai termini attualmente inclusi nella Proposta. Finché le critiche sollevate in questi capitoli saranno formulate correttamente, si sarebbe dovuto inserire in ogni sottosezione un'inclusione de lege ferenda per determinare esplicitamente come la Proposta dovrebbe affrontare la questione dell'inclusione finanziaria e digitale. In particolare, diversi aspetti direttamente collegati all'inclusione finanziaria e digitale potrebbero beneficiare di un'ulteriore esplorazione, consentendo future linee di ricerca come quelle descritte di seguito.

Pertanto, considerando gli obiettivi di inclusione finanziaria della popolazione underbanked, potenziali benefici derivanti dall'emissione dell'euro digitale sono stati trascurati nella Proposta. Nel testo sono stati inseriti solo riferimenti generici, senza fare riferimento a misure concrete per migliorare l'accesso di questo settore della popolazione ai servizi di intermediazione finanziaria, soprattutto quando il legislatore europeo ha esplicitato che l'euro digitale non è equivalente a un conto bancario pubblico, nonostante le sue somiglianze. Dal momento che i benefici associati all'implementazione dell'euro digitale per la popolazione *underbanked* sono già stati affrontati dalle autorità dell'Unione europea, un'analisi approfondita del design ottimale per il prossimo regolamento sulla

sua emissione potrebbe includere misure concrete per raggiungere tale obiettivo. Tali misure potrebbero includere il coinvolgimento del settore pubblico nell'intermediazione finanziaria quando si accede ai servizi dell'euro digitale o l'implementazione di una versione migliorata del punteggio di credito per garantire l'accesso di questo settore della popolazione a finanziamenti migliori.

Da parte sua, considerando gli obiettivi di inclusione digitale di alcuni settori della popolazione che hanno difficoltà con la tecnologia o non possono accedervi, la Proposta non affronta il tema di conseguenza, poiché non offre un piano d'azione concreto. Ad oggi non è stata pubblicata alcuna documentazione ufficiale in merito a questo tema, nonostante il suo esplicito riconoscimento nell'articolo 22. Nel testo si trovano solo riferimenti minimi a ciò che deve essere fatto per garantire un accesso adeguato all'euro digitale a chi ha bisogno di assistenza, e anche questi possono essere migliorati. Inoltre, la proposta fa eccessivo affidamento sui dispositivi mobili per l'accesso e l'utilizzo dell'euro digitale, e non sono state incluse alternative analogiche , aumentando il rischio di esclusione e di esecuzione di pagamenti non autorizzati per i potenziali utenti dell'euro digitale non esperti di tecnologia. È necessario sviluppare una linea di ricerca interamente incentrata sull'elaborazione delle considerazioni legali per garantire a questi utenti un'adeguata accessibilità all'euro digitale, in linea con alcune delle idee originali che sono state incluse in questa tesi.

In aggiunta al paragrafo precedente, l'imposizione di un determinato standard tecnologico, come fa la Proposta all'articolo 22 per i portafogli europei di identità digitale, potrebbe beneficiare di un ulteriore supporto da parte del mondo accademico giuridico. Sebbene la sua inclusione sia già stata criticata in questa Tesi, una linea di ricerca incentrata sulla determinazione dello standard adeguato potrebbe migliorare la Proposta. Nonostante le considerazioni della Banca Centrale Europea sull'argomento, la designazione di standard tecnologici, in linea con il contenuto dell'Atto europeo sull'accessibilità, trarrebbe sicuramente beneficio da ulteriori ricerche in questa direzione.

Analisi del livello ottimale di anonimizzazione per le operazioni di pagamento digitale in euro. Come analizzato nel Capitolo 6 della Tesi, il legislatore europeo ha concepito le operazioni di pagamento in euro digitali in modo da fornire un diverso livello di privacy a seconda che la transazione sia considerata online o offline, non soddisfacendo in ogni caso le richieste dei potenziali utenti di euro digitali. Sebbene le disposizioni della

proposta sembrino corrispondere ai requisiti delle misure antiriciclaggio e antiterrorismo adottate nell'Unione europea, c'è ancora spazio per miglioramenti che garantiscano la minimizzazione dei comportamenti disonesti da parte di un settore concreto dei potenziali utenti dell'euro digitale. Nella tesi è stato proposto un approccio alternativo all'anonimizzazione delle transazioni di pagamento digitale in euro sia online che offline. Tuttavia, un'analisi approfondita di questa alternativa può essere condotta al fine di progettare un livello ottimale di privacy, incoraggiando altri ricercatori a contribuire a questa direzione.

Una linea di ricerca potrebbe essere sviluppata in questa direzione. In primo luogo, si potrebbe effettuare un'analisi teorica del continuum da "nessuna supervisione" a "supervisione completa" delle operazioni di pagamento digitale in euro, per determinare i rischi associati a ogni punto dello spettro considerato, includendo nell'analisi tutte le disposizioni legali pertinenti emanate nell'Unione europea. Ciò consentirebbe di analizzare i potenziali benefici derivanti da considerazioni alternative contenute nella proposta. In secondo luogo, l'analisi potrebbe includere anche approcci alternativi seguiti da altri Stati che stanno attualmente implementando un progetto CBDC, poiché la privacy può essere migliorata grazie a diverse caratteristiche di un'architettura CBDC. In terzo luogo, il coinvolgimento di altre aree di conoscenza nell'analisi, come le scienze informatiche, contribuirebbe a sviluppare uno standard tecnologico che soddisfi sia i requisiti legali sia le possibilità offerte dalle misure più avanzate in termini di tecnologia dei pagamenti digitali.

L'analisi di cui sopra è stata inclusa come limite della tesi a causa delle difficoltà legate all'analisi della documentazione tecnica sull'euro digitale. Sebbene la documentazione tecnica sull'euro digitale sia spesso disponibile, di solito non è destinata al grande pubblico, ma ai partner di attuazione delle autorità dell'Unione europea. Ciò riduce la possibilità di ampliare l'analisi da un punto di vista scientifico, poiché il più delle volte solo i collaboratori preselezionati possono accedere a tale documentazione. Di conseguenza, lo sviluppo di idee in ambito tecnologico ne risente, come nel caso di questa tesi, ed è per questo che si incoraggia una futura linea di ricerca sul tema, con un approccio multidisciplinare.

Analisi della contraffazione delle operazioni di pagamento offline in euro digitali. Come già osservato nel Capitolo 6 della Tesi, le implicazioni tecniche relative alla

prevenzione della produzione di euro digitali contraffatti non vengono mai affrontate nella Proposta, nonostante siano esplicitamente trattate al punto 3 dell'Allegato IV della Proposta. Secondo il legislatore europeo, le operazioni di pagamento in euro digitali offline potrebbero essere sfruttate per duplicare i fondi in assenza di adeguate misure di sicurezza. Tuttavia, la mancanza di azioni da parte delle autorità dell'Unione Europea raccomanda di studiare lo stato dell'arte della tecnologia coinvolta nelle transazioni, concentrandosi sui dispositivi mobili utilizzati per consentire i pagamenti digitali offline in euro, per analizzare se è possibile, come prevenirlo e includere sanzioni specifiche per scoraggiare questo tipo di comportamento disonesto.

Appendix D

Capítulo 7 - Conclusiones

Durante los últimos seis capítulos se ha analizado en profundidad la Propuesta de creación del euro digital , tratando de identificar las opciones de diseño más relevantes adoptadas por las autoridades de la Unión Europea a la hora de determinar las características de la nueva manifestación digital de la moneda única.[1] El objetivo principal de este estudio, tal y como se describe en el Capítulo 1 de la Tesis, ha sido proporcionar adecuadamente una revisión de la estructura jurídica del próximo euro digital, centrándose en aquellos aspectos que plantean una mayor complejidad doctrinal tanto para la academia jurídica como para el legislador europeo. Para lograr dicho objetivo, este estudio ha proporcionado el contexto académico que justifica el diseño actual de la Propuesta, disposición por disposición, empleando una metodología enfocada a proporcionar una perspectiva holística y comprensiva de la estructura jurídica propuesta para el próximo euro digital. Así, el objetivo de este estudio ha sido recopilar el conocimiento jurídico, económico y técnico existente en el tema de las monedas digitales de banco central (CDBC) en general, y del euro digital en particular, para crear una obra de referencia sobre la que otros investigadores puedan basarse, ampliando el análisis.

El análisis jurídico realizado en esta Tesis ha contribuido a determinar si se han satisfecho las expectativas de las partes interesadas pertinentes del euro digital. Mientras que los actores relevantes del panorama de los pagos digitales, como los proveedores de servicios de pago (PSP), han visto materializadas sus peticiones en el texto de la Propuesta, los posibles usuarios del euro digital han reconocido que algunas de sus preocupaciones no han sido tratadas con cuidado, lo que ha propiciado un debate sobre

[1] The footnotes in this chapter have been intentionally left out of the text. The reader is kindly requested to check the references, as needed, in Chapter 7 of the Thesis.

si el euro digital es el medio de pago digital público que los ciudadanos de la zona euro necesitan y merecen. En consecuencia, aún se esperan varios cambios en el texto final de la Propuesta, antes de ser ratificada por el procedimiento legislativo de la Unión Europea. Aunque no todos estos cambios tienen su origen en los deseos de la población de la Unión Europea, el análisis realizado en el Capítulo 2 de esta Tesis anima al legislador europeo a comprender las necesidades de la ciudadanía antes de imponer un medio de pago que no satisfaga sus expectativas en términos de usabilidad o privacidad de las transacciones.

Además, este estudio ha contribuido a identificar las características esenciales del próximo euro digital, explorando sus posibles consecuencias en la adopción por parte de los usuarios y los probables conflictos que pueden surgir en el futuro, tal como está redactada la Propuesta en la actualidad. De este modo, el análisis realizado en cada uno de los seis capítulos anteriores ha sido diseñado para contribuir a la detección de fallos en las disposiciones de la Propuesta, animando al legislador europeo a modificar el texto allí donde se requieran aclaraciones adicionales o el contenido de la disposición pueda acarrear consecuencias no deseadas una vez sea definitiva. Dicho análisis se ha basado en la bibliografía previa pertinente del mundo académico jurídico europeo, ya que el tema en torno a la emisión de un euro digital ha atraído la atención de estudiosos internacionales. Sin embargo, debido a la naturaleza holística del presente trabajo y a la metodología de análisis empleada, no se han abordado en profundidad todos los detalles incluidos en la Propuesta, por lo que se anima a un futuro análisis más profundo para determinar adecuadamente las consecuencias del diseño del euro digital tal y como está redactado en la actualidad. Así, se identifican futuras líneas de investigación, algunas de las cuales ya están siendo elaboradas por el equipo de investigación del que forma parte este autor novel, para contribuir en esta dirección, en un intento de asegurar la implantación impecable de un euro digital que satisfaga las necesidades de todos los interesados con un diseño avalado por la investigación académica.

Teniendo en cuenta lo anterior, este capítulo final se estructura de la siguiente manera: en primer lugar, se ofrece una descripción de lo que es, y lo que no es en su forma actual, el euro digital, determinando si se han satisfecho adecuadamente las expectativas previas de todos los agentes relevantes en el panorama de los pagos digitales, a saber, los PSP y los posibles usuarios del euro digital. En segundo lugar, se ofrece un catálogo de cambios esperados en el texto de la Propuesta, determinando qué se mejorará en la versión final

del próximo Reglamento para el establecimiento del euro digital. En tercer lugar, se ofrece una descripción de las características clave del euro digital analizadas en esta Tesis, siguiendo la estructura de capítulos presentada, que imita de algún modo la estructura de la Propuesta. Por último, se enumeran las limitaciones del presente estudio y se ofrecen futuras líneas de investigación basadas en las mismas.

D.1 Expectativas sobre la emisión prevista del euro digital

Desde que en octubre de 2020 el Banco Central Europeo abordara el planteamiento inicial sobre la creación y emisión del euro digital, el diseño del CBDC de la Unión Europea ha visto modificadas sus características a lo largo del tiempo. Como ya se abordó en el Capítulo 1 de la Tesis, el euro digital se concibió originalmente para complementar el papel del dinero del banco central en su forma física, permitiendo a la población acceder a los pagos digitales con una alternativa pública no sujeta a los intereses de las partes privadas. De este modo, se garantizaba que el euro digital introdujera varias ventajas en el sistema de pagos digitales, promoviendo la inclusión financiera de la población no bancarizada, así como características de accesibilidad para aquellos que necesitan la inclusión digital, y apoyando la transmisión de la política monetaria del Banco Central Europeo. Todo ello teniendo en cuenta las necesidades y preferencias de los usuarios, como la facilidad de uso y la accesibilidad, siendo esencial la interoperabilidad, la privacidad y la protección de datos, introduciendo la tensión entre la trazabilidad y el deseo de anonimización, así como la seguridad en las transacciones. Así, estas preferencias, que fueron ratificadas por los ciudadanos de la Unión Europea en 2021, debían convertirse en las características fundacionales del euro digital, sin embargo, el diseño final incluido en la Propuesta puede no estar completamente alineado con aquellas, en particular cuando se trata de la privacidad en las transacciones de pago.

Una de las aportaciones de este trabajo ha sido la adecuada identificación de lo que es el euro digital tal y como se describe en los 42 artículos de la Propuesta, en contraste con lo que las autoridades de la Unión Europea habían descrito previamente en documentación no vinculante. Así, el siguiente subapartado contribuye a clarificar lo que los futuros usuarios del euro digital pueden razonablemente esperar de la emisión del CBDC.

D.1.1 ¿Qué es el euro digital propuesto y qué no es?

Como ya se ha descrito en el Capítulo 1 de la Tesis, el euro digital ha sido diseñado para funcionar como un CBDC minorista híbrido, basado en cuentas, que se ejecuta en una infraestructura de liquidación convencional basada en la tecnología TARGET Instant Payment Settlement (TIPS). Las opciones elegidas por el legislador europeo en este sentido han estado meticulosamente definidas por el objetivo principal que se ha marcado con la implantación del euro digital, que es permitir su uso a un amplio sector de la población dentro de la Unión Europea. Así, el euro digital será un medio de pago público destinado a permitir a los ciudadanos de la zona del euro acceder a una manifestación digital del dinero del banco central tanto para operaciones de pago en línea como fuera de línea. Además de esto, la Propuesta ha establecido varias características relativas a su accesibilidad y uso, asegurando que cualquier usuario potencial dentro del ámbito territorial de la Propuesta, tendrá derecho a realizar operaciones de pago utilizando su cuenta de pago en euros digitales con facilidad. Por último, el legislador europeo ha garantizado que el euro digital salvaguarde la intimidad de sus usuarios mejor que los medios de pago digitales alternativos procedentes de agentes privados, al tiempo que proporciona a las autoridades y al poder judicial información suficiente para prevenir el blanqueo de dinero y la financiación del terrorismo. En definitiva, el euro digital se ha diseñado para ofrecer un mejor medio de pago a la población de la Unión Europea, aportando mejoras marginales respecto a la tecnología existente disponible para los pagos digitales.

Sin embargo, determinar lo que el euro digital no es, según las disposiciones de la Propuesta, podría ser más revelador para su análisis, ya que proporciona un contexto relevante sobre el alcance del progreso tecnológico que se logrará con su implementación. Así, el euro digital no puede equipararse a ninguna forma de criptoactivo que funcione en una infraestructura de liquidación basada en DLT, no es equivalente a una cuenta bancaria pública ni a un instrumento financiero que devengue intereses, no puede actuar como dinero programable, y apenas mejora el nivel de privacidad que proporcionan los medios de pago equivalentes de titularidad privada. En definitiva, el euro digital no es ni una manifestación invisible de la tecnología ni una revolución revolucionaria para el sistema financiero, pese al potencial que encierran los CBDC en este sentido.

Es difícil no pasar por alto la idea de que la implantación del euro digital, tal y como

está diseñado en la Propuesta, es una oportunidad perdida para mejorar la posición de los consumidores en la Unión Europea y para promover una intermediación de servicios financieros más justa. Si bien es sensato entender que la implantación de un euro digital que incluya algunas de las características descritas en el párrafo anterior acabaría provocando una competencia no deseada con los bancos comerciales que podría acabar poniendo en peligro el sistema financiero en su conjunto, el instrumento resultante no tiene garantizado su éxito a pesar de ser necesario para los hábitos de pago de los consumidores de hoy en día. Se anima al legislador europeo a revisar el alcance de la Propuesta para determinar si es recomendable seguir adelante con la implantación del euro digital tal y como está diseñado actualmente, considerando el riesgo de emitir la nueva manifestación digital de la moneda única sólo para ver cómo es acogida por la población de la Unión Europea.

D.2 Cambios previstos en la Propuesta antes de la publicación del Reglamento definitivo

La minuciosa revisión de la Propuesta realizada en la Tesis ha permitido identificar los cambios más relevantes que se espera introducir en sus disposiciones en la versión definitiva del texto. Mientras que algunos de estos cambios previstos encuentran su razón de ser en meros errores de imprenta o en referencias a versiones anteriores e inéditas de la Propuesta, otros se basan en consideraciones jurídicas aportadas por el Banco Central Europeo o por la doctrina jurídica. En esta sección se enumeran estos cambios y se hace referencia a su motivación, tal y como se ha abordado previamente en los seis capítulos anteriores de la Tesis.

D.2.1 a) Cambios en el Capítulo III ("Curso legal")

Como se ha visto en el Capítulo 2 de la Tesis, se anima al legislador europeo a considerar una modificación menor en el artículo 9 de la Propuesta. Desde una perspectiva estructural, no se justifica la ubicación de la disposición final del artículo 9, ya que sólo afecta a la letra b) de dicho artículo, según se determina expresamente. Por tanto, podría haberse incluido a continuación de la última frase de dicha letra, mejorando la legibilidad de la disposición. Del mismo modo, la letra c) del artículo 9 de la Propuesta incluye una

referencia a "actividades personales o domésticas". Como ya se ha comentado anteriormente, a pesar de estar contempladas en el Considerando (18) de la Propuesta, estas actividades no se describen en ninguna parte del texto. Debido a sus implicaciones, se anima al legislador europeo a proporcionar una definición en la versión definitiva de la Propuesta.

En cuanto a las definiciones que faltan, el artículo 11 de la Propuesta también podría beneficiarse de la inclusión de otra. Las "excepciones de naturaleza de derecho monetario" incluidas en dicha disposición, a pesar de abordarse brevemente en el Considerando (19), no se describen en ninguna parte de la Propuesta, lo que conduce a la imposibilidad de comprender de antemano en qué circunstancias sería posible introducir nuevas excepciones al principio de aceptación obligatoria del euro digital.

D.2.2 Cambios en el Capítulo IV ("Distribución")

Los cambios previstos para el Capítulo IV de la Propuesta se refieren a la inclusión de definiciones adecuadas para varios conceptos a los que se hace referencia en el texto, pero que carecen de una definición adecuada que garantice la categorización de sus implicaciones. Así, mientras que la Propuesta define adecuadamente "tasa por servicios comerciales", no existe una definición de "tasa entre PSV", a pesar de que se abordan conjuntamente en la Propuesta. En aras de la claridad, se anima al legislador europeo a considerar la inclusión de una definición también para esta última.

Por su parte, el legislador europeo está obligado a garantizar la claridad al abordar los temas de la inclusión digital y financiera, ya que ambos conceptos se abordan conjuntamente en el texto, siendo referenciados indistintamente por error. Dado que ambos conceptos hacen referencia a diferentes escenarios no deseados, ofreciendo definiciones separadas podría mejorar la capacidad del lector para abordarlos en consecuencia. Además de eso, también se anima al legislador europeo a unificar adecuadamente tres categorías diferentes también enumeradas en el texto. En un intento de unificar conceptos, se enumeran hasta tres categorías diferentes: población "no bancarizada", "infrabancarizada" y "no conectada" en el Considerando (5) de la Propuesta. Mientras que las dos primeras se refieren claramente a la misma realidad, "población offline" no sólo se refiere a un sector de la población que no puede acceder a la intermediación financiera, sino a un sector de la población que tiene dificultades con la tecnología. Por lo tanto, las dos

primeras categorías pertenecen a la inclusión financiera, mientras que la tercera hace referencia a la inclusión digital.

D.2.3 Cambios en el Capítulo V ("Uso del euro digital como reserva de valor y como medio de pago")

El Capítulo V de la Propuesta incluye los cambios más prospectivos debido a la naturaleza de sus disposiciones, que abordan el uso del euro digital como depósito de valor y como medio de pago, que se han regulado drásticamente para evitar una competencia no deseada con los bancos comerciales. En consecuencia, la naturaleza de estos cambios prospectivos va más allá de la ausencia de definiciones, como ocurre en otros capítulos, y se centra en modificaciones específicas del texto de la Propuesta relativas a la aplicación de límites de tenencia para las cuentas de pago en euros digitales.

Así, el contenido del artículo 16 de la Propuesta es discutido por varias razones. En primer lugar, el texto de la Propuesta sugiere que el establecimiento de límites al euro digital es una característica opcional, sin embargo, se exige al Banco Central Europeo que desarrolle instrumentos para limitar el uso del euro digital como depósito de valor, algo que la autoridad monetaria ha criticado por parecer incompatible. En segundo lugar, la convención de nomenclatura utilizada por la Comisión Europea en la Propuesta para cada uno de los límites considerados en esta disposición puede considerarse confusa, especialmente cuando no se proporcionan definiciones para cada una de las categorías. Y, en tercer lugar, la consideración de imponer los mismos límites de tenencia en cada Estado miembro puede dificultar la distribución del euro digital y su aceptación y uso efectivo en toda la zona euro, ya que un límite de tenencia común puede tener implicaciones diferentes para la población de cada Estado miembro.

Considerando la naturaleza específica de los límites de tenencia de euros digitales fuera de línea, la Propuesta no aborda si es posible mantener euros digitales fuera de línea en diferentes dispositivos propiedad del usuario. Puesto que puede ser posible, la Propuesta debería abordar la posibilidad, o rechazarla totalmente, para determinar los efectos en la liquidación de las operaciones de pago en euros digitales y la seguridad, ya que puede resultar poco práctico para los usuarios de euros digitales con acceso limitado a Internet que comparten una cuenta de pago en euros digitales. Se anima al legislador europeo a realizar un análisis en profundidad de casos especiales de uso como éste para

garantizar que el diseño final del euro digital no deja de lado a sectores específicos de la población. Del mismo modo, la definición actual de los límites de tenencia cuando se consideran múltiples cuentas propiedad de un usuario del euro digital, o una cuenta de pago en euros digital propiedad de múltiples usuarios, puede permitir explotaciones no deseadas por parte de posibles usuarios del euro digital, como se describe en el Capítulo 3 de la Tesis.

En cuanto al uso del euro digital como medio de pago, a pesar de la inclusión explícita de los servicios básicos de pago en euros digitales, que se pretende que sean gratuitos para las personas físicas, el texto de la Propuesta no garantiza que puedan ofrecerse gratuitamente características esenciales como las funcionalidades de financiación y desfinanciación automatizadas, lo que puede desalentar la adopción del euro digital. El Banco Central Europeo ha solicitado al legislador europeo que revise esta cuestión y actualice el texto de la Propuesta en este sentido.

Además, el Banco Central Europeo ha llamado la atención del legislador europeo sobre otras dos inclusiones de la Propuesta. En primer lugar, a pesar de que la Propuesta exige que se determine el importe máximo de los gastos comerciales y las tasas entre PSV, el Banco Central Europeo ha señalado que carece de la autoridad adecuada para hacerlo. Por lo tanto, si la autoridad monetaria publicara dichos importes, no podría considerarse una determinación de iure. En caso de que algún afectado las impugnara y sometiera a control judicial, podría concederse un recurso de anulación, poniendo en peligro los objetivos asociados a dicha publicación. En segundo lugar, el Banco Central Europeo ha animado al legislador europeo a determinar qué es "un grupo representativo" de PSP, tal y como se solicita en el artículo 17 de la Propuesta. Ambas circunstancias recomiendan al legislador europeo realizar cambios en el texto de la Propuesta para abordar las dificultades señaladas por la autoridad monetaria.

D.2.4 Cambios en el Capítulo VI ("Distribución del euro digital fuera de la zona del euro")

En cuanto al Capítulo VI de la Propuesta, los cambios previstos incluyen mejoras en la estructura de los artículos 19 y 21 para permitir una mejor comprensión del contenido de dichas disposiciones. Así, tal y como se identificó previamente en el Capítulo 4 de la Tesis, la estructura elegida por el legislador europeo para el Artículo 19, y en particular para sus

puntos 3 y 4, podría resultar confusa para el lector. A pesar de que podría argumentarse que el lector aún puede inferir las consecuencias al leer en conjunto tanto el punto 3 como el 4, es bastante improbable que la Unión Europea firme un acuerdo con un tercer país que ya ha sido identificado como problemático en términos de medidas ALD/CFT, por lo que se recomienda una reformulación.

Por su parte, el contenido del artículo 21 de la Propuesta requiere al menos dos modificaciones. En primer lugar, tal y como se señala en el análisis de dicha disposición en el Capítulo 4 de la Tesis, la Propuesta habilita la posibilidad de permitir pagos cruzados entre el euro digital y otras monedas siempre que sean objeto de un acuerdo previo entre el Banco Central Europeo y los bancos centrales nacionales de los Estados miembros cuya moneda no sea el euro "y" los terceros países. El lenguaje de la disposición utiliza "y" en lugar de "o". Aunque el mensaje sigue siendo claro, se recomienda el uso de una conjunción disyuntiva para evitar cualquier confusión al lector, de ahí la recomendación dirigida al legislador europeo. Además, la ausencia de una definición de los pagos transfronterizos presenta dificultades para el lector, ya que no se refieren a las mismas circunstancias que los pagos transfronterizos, para los que existen definiciones en otras fuentes del Derecho de la Unión Europea. Aunque el concepto no es nuevo en sí mismo, una definición adecuada garantizaría la armonización futura cuando se aborde el tema tras la primera emisión del euro digital.

D.2.5 Cambios en el Capítulo VII ("Características técnicas")

Los cambios previstos en el capítulo VII de la propuesta se refieren sobre todo a la falta de definiciones necesarias o a la ausencia de una característica técnica del euro digital en una de las disposiciones. Sin embargo, el primer requisito para el legislador europeo también se refiere al Capítulo II de la Propuesta, ya que el artículo 27 hace referencia explícita a la Segunda Directiva sobre Servicios de Pago (PSD2) a pesar de que el artículo 5 incluye su próximo sustituto, la Tercera Directiva sobre Servicios de Pago. Se anima al legislador europeo a alinear las referencias para evitar la complejidad para el lector, ya que la legislación aplicable debe abordarse de manera uniforme en todo el texto.

Sigue siendo necesaria una definición adecuada de "servicios frontales" en la propuesta. A pesar de proporcionar una definición para los servicios frontales, la Propuesta no aclara adecuadamente lo que se está regulando en el artículo 28 de la Propuesta. Si bien el

concepto puede aproximarse a la interfaz de usuario que permite a los usuarios acceder a todos los servicios del euro digital, tal como se describe en el Anexo I de la Propuesta, la definición actual no satisface ni a un operador técnico ni a un usuario estándar del euro digital, por lo que podría fomentarse una revisión, ya que, tal como está redactada en este momento, no representa lo que se pretende regular. Además de esto, también se anima al legislador europeo a revisar el contenido del artículo 28 de la Propuesta, ya que los PSP que pueden utilizar servicios de front-end propietarios pueden acabar engañando a los usuarios haciéndoles creer que necesitan una cuenta de euro no digital para utilizar las funcionalidades de la cascada, a pesar de no ser el caso según la Propuesta.

Por último, podría argumentarse que la ubicación del artículo 29 de la Propuesta no es la óptima, ya que se refiere a un tema escasamente técnico. Si bien es cierto que la disposición se refiere a una verificación técnica de las limitaciones que los PSP deben realizar con los usuarios del euro digital, esta disposición está más vinculada al tema de la distribución del euro digital y la aplicación de límites de tenencia, lo que puede recomendar su ubicación en otro lugar de la Propuesta.

D.2.6 Cambios en el Capítulo VIII ("Privacidad y protección de datos")

En cuanto al Capítulo VIII de la Propuesta, sólo se requiere una definición adicional, ya que el concepto de "punto de acceso único" al que se hace referencia en el punto 6 del artículo 35 de la Propuesta no se amplía en ninguna parte del texto principal de la Propuesta, ni en los Anexos. Dado que se trata de un concepto técnico que permite ciertas características de salvaguardia del euro digital, es necesario entender qué implica y qué tecnología se utilizaría para ello.

Además de la definición que falta, dos conceptos adicionales requieren un mayor contexto debido a sus implicaciones en la emisión del euro digital. En primer lugar, el análisis de la falsificación de las operaciones de pago en euros digitales fuera de línea no se aborda en ninguna parte de la Propuesta, aunque el legislador europeo hace explícita su preocupación en el Anexo IV, lo que demuestra que su análisis se ha tenido en cuenta a la hora de diseñar el euro digital. En el Capítulo VII ("Características técnicas") de la Propuesta debería haberse incluido un análisis técnico, aunque jurídico, adecuado sobre el tema. En segundo lugar, hay varias referencias a lo largo del texto de la Propuesta que insinúan la idea de diferentes "tipos" de cuenta de pago en euros digitales, pero ninguna

referencia concreta en el texto. Por lo tanto, se anima al legislador europeo a aclarar si se trata de una posibilidad, y las consecuencias de tal diferenciación, o a mejorar el lenguaje de la Propuesta para garantizar la claridad para el lector.

D.2.7 Cambios en el Capítulo IX ("Lucha contra el blanqueo de capitales")

Por último, los cambios previstos en el Capítulo IX de la Propuesta se limitan a definiciones concretas. En particular, la referencia a las normas contra el blanqueo de capitales (AML) en el artículo 37 podría mejorarse incluyendo una referencia explícita a la lucha contra la financiación del terrorismo (CFT), ya que se incluye en el análisis. Dado que otras fuentes de Derecho primario de la Unión Europea ya hacen referencia a ambas, sería recomendable actualizar el título del capítulo, así como el título del artículo. Del mismo modo, la falta de una definición para los datos de las transacciones y para la Unidad de Inteligencia Financiera recomienda al legislador europeo que proporcione un contexto suficiente. En el caso de los primeros, las dificultades pueden derivarse del hecho de que los "datos de las transacciones" pueden no ser datos personales, lo que hace que el análisis jurídico vaya más allá de la perspectiva de la privacidad. En el caso del segundo, la Unidad de Inteligencia Financiera no se define en la Propuesta, ni en la Directiva 2015/849 ni en la COM/2021/420, como se señala en el capítulo 6 de la Tesis. En consecuencia, no es posible entender quién forma parte de dicho organismo y cuáles son sus competencias.

Además, la referencia a la próxima sustitución de la Directiva sobre blanqueo de capitales debe reflejarse adecuadamente en todo el texto de la Propuesta. Mientras que algunas referencias en la Propuesta identifican la aplicación de COM/2021/423, esto no se incluye en el artículo 5 de la Propuesta. Este comportamiento contradice otros actos legislativos que siguen siendo condicionales, como COM/2023/366 final y COM/2023/367 final, ya que sustituirán a la Directiva (UE) 2015/2366 (DSP2) una vez que entren en vigor, que se incluyen en el artículo 5 de la Propuesta. Lo que resulta difícil es que la COM/2021/423 se incluya en el artículo 6 de la Propuesta, lo que aumenta la confusión del lector. Es necesario alinear estas dos disposiciones con el Capítulo IX de la Propuesta.

D.3 Principales características analizadas en la Tesis

A lo largo de los seis capítulos anteriores de la Tesis, se ha realizado un análisis jurídico pormenorizado del contenido de la Propuesta, centrándose en las consideraciones que mayor complejidad doctrinal aportan tanto para la doctrina jurídica como para el legislador europeo. Como resultado, el contenido de cada capítulo aporta información esclarecedora en relación con la próxima emisión del euro digital, considerando cada uno de los temas generales abordados en la Propuesta. En este apartado se señalan los aspectos clave que se han analizado en cada capítulo de la tesis, prestando especial atención a las ideas originales que han surgido del análisis de la estructura jurídica del euro digital, proporcionando así un marco de referencia que contribuya en la misma dirección que la academia jurídica, hacia un análisis adecuado de las consecuencias de la implantación del euro digital.

Así, el capítulo inicial ofrece un análisis exhaustivo de la evolución del contexto jurídico en torno a los pagos digitales. Repasa las respuestas normativas desde 2007 hasta la actualidad, destacando los hitos significativos en la Unión Europea y los cambios en las políticas para abordar adecuadamente los requisitos del comercio electrónico. Se introduce el concepto de moneda digital de banco central, junto con una categorización detallada y un análisis de los beneficios asociados a su implantación, así como casos de uso de una CBDC. También se ofrece el contexto de la Propuesta sobre el establecimiento del euro digital, analizando su conceptualización inicial, las preocupaciones iniciales de la población y el diseño final elegido para la manifestación digital de la moneda única. Por último, se abordan tanto el objetivo de la Tesis, , como la metodología empleada.

Por su parte, el capítulo 2 de la Tesis profundiza en el concepto jurídico de dinero, examinando cómo encaja el euro digital en las construcciones jurídicas existentes de las tres funciones del dinero: unidad de cuenta, depósito de valor y medio de pago. Tras examinar el contenido del capítulo III de la Propuesta, el capítulo se centra en el curso legal del euro digital. Este análisis incluye las implicaciones del principio de aceptación obligatoria, el requisito de aceptar el euro digital por su valor nominal íntegro y su capacidad para liberarse de obligaciones de deuda. Además, aborda las limitaciones a dicho principio de aceptación obligatoria, así como la interacción prevista entre el euro digital y los billetes y monedas físicos en euros.

El Capítulo 3 de la Tesis se centra en el contenido del Capítulo V de la Propuesta, analizando las funciones del euro digital como depósito de valor y como medio de pago. En él se examinan los límites de tenencia propuestos para las operaciones de pago en euros digitales, cuyo objetivo es evitar un excesivo atesoramiento por parte de los usuarios del euro digital, garantizando la estabilidad financiera y evitando una competencia no deseada con los bancos comerciales. Además, se analiza críticamente la opción de diseño para evitar que el euro digital se convierta en un instrumento financiero que devengue intereses, y se consideran enfoques alternativos ya presentes en la academia jurídica europea. En cuanto a la utilización del euro digital como medio de pago, se aborda la evidente tensión existente entre la aceptación obligatoria derivada del carácter de moneda de curso legal del euro digital y el objetivo de las autoridades de la Unión Europea de que el euro digital sea gratuito para las personas físicas. Por último, en este capítulo también se analiza el sistema de incentivos diseñado para regular las comisiones a los comerciantes y las comisiones entre PSP que éstos imponen, el cual está adecuadamente diseñado para minimizar los costes a lo largo del tiempo.

En el Capítulo 4 de la Tesis, se examina el contenido de los Capítulos IV y VI de la Propuesta, centrándose en los usuarios del euro digital, la distribución del euro digital dentro de la zona del euro y los servicios de pago en euros digitales que se enuncian actualmente en la Propuesta. En particular, se considera el papel de los PSP en la distribución del euro digital, así como las características esenciales de los servicios de pago en euros digitales, tales como las funcionalidades de cascada y cascada inversa. Además, se analizan las consideraciones jurídicas sobre la relación que puede surgir entre el Banco Central Europeo, los PSP y los usuarios del euro digital. Más adelante en el capítulo, se estudia el acceso al euro digital dentro de la zona del euro, centrándose en la naturaleza de los servicios básicos de pago en euros digitales descritos en el Anexo II de la Propuesta, el posible solapamiento entre el euro digital y una cuenta bancaria básica como se describe en la Directiva (UE) 2014/92, y el tema de la inclusión digital y financiera. Por último, se analiza el acceso al euro digital fuera de la zona del euro y la posibilidad de habilitar pagos entre divisas dentro de la infraestructura de liquidación del euro digital.

El Capítulo 5 de la Tesis examina el Capítulo VII de la Propuesta, centrándose en las características técnicas incluidas en el diseño final del euro digital. Así, se consideran

el diseño y la accesibilidad del euro digital, así como las diferencias existentes entre las operaciones de pago en euros digitales en línea y fuera de línea, con un análisis adicional de la consideración específica de las operaciones en un pago de proximidad, que pueden escapar a la categorización regular incluida en la Propuesta. Las operaciones de pago digital en euros condicionales se analizan a fondo para diferenciarlas del dinero programable, tal como solicita el legislador europeo. A continuación, se estudian diversos temas técnicos, como la inclusión explícita de las Carteras Europeas de Identidad Digital en la Propuesta, las consideraciones específicas para la liquidación de las operaciones de pago digital en euros tanto en línea como fuera de línea, las mejoras en la detección del fraude en las operaciones de pago digital en euros en línea con respecto al marco normativo vigente, y las dificultades que rodean a la implantación de un sistema que garantice el acceso no discriminatorio a los dispositivos móviles para el uso del euro digital, garantizando al mismo tiempo la seguridad de todos sus participantes.

Por último, el Capítulo 6 de la Tesis repasa el contenido de los Capítulos VIII y IX de la Propuesta, centrándose en la privacidad y la protección de datos, así como en las medidas de lucha contra el blanqueo de capitales y la financiación del terrorismo, en las operaciones digitales de pago en euros. Así, tras proporcionar el contexto general de la contradicción existente entre privacidad y pagos digitales, se analizan los datos que tratan los PSP, el Banco Central Europeo, y los proveedores de servicios de apoyo , centrándose en las diferencias existentes entre ellos y en los beneficios esperados en términos de privacidad para los futuros usuarios del euro digital. En cuanto a las medidas contra el blanqueo de capitales, se critica en primer lugar la estructura del Capítulo IX de la Propuesta, , y a continuación su contenido, ya que se centra exclusivamente en las operaciones de pago digitales en euros fuera de línea. Además, dado que la alternativa propuesta para las transacciones fuera de línea no puede considerarse óptima, se ofrece un enfoque alternativo de la anonimización. Por último, se aborda adecuadamente la justificación de los límites de transacción y tenencia que sólo se aplica a las operaciones digitales de pago en euros fuera de línea, cerrando el análisis del contenido de la Propuesta.

D.4 Limitaciones de este estudio y futuras líneas de investigación

Como se ha señalado al inicio de este capítulo final de la Tesis, el objetivo de este estudio ha sido analizar la estructura jurídica del euro digital tal y como se plasma en la Propuesta de creación del mismo. Si bien dicho objetivo es loable en sí mismo, el análisis de la Propuesta y del resto de actos legislativos relevantes que han sido objeto de estudio ha puesto de manifiesto que el análisis aquí incluido podría beneficiarse de un enfoque en profundidad que se centrara en algunos aspectos de gran relevancia para la academia jurídica que aún requieren investigación adicional. Por ello, en este apartado final se presentan aquellas ideas que han sido apuntadas a lo largo de la Tesis, en orden secuencial, pero que no han sido analizadas en profundidad. En cualquier caso, estas limitaciones del presente estudio se postulan como interesantes líneas futuras de investigación para juristas y académicos interesados en el progreso científico de la implantación del euro digital y otros CBDCs en todo el mundo.

Un meta-análisis de la literatura sobre CBDC. Aunque no todo lo considerado en la literatura específica sobre CBDC puede ser de utilidad para el análisis jurídico del euro digital, un enfoque sistémico de toda la literatura existente, aunque relevante, podría ser de ayuda para promover un análisis holístico sobre características que pueden haber sido pasadas por alto en el análisis presentado en esta Tesis. De este modo, se podría haber realizado un estudio más exhaustivo y completo para apoyar, o contrastar, cualquier decisión tomada por el legislador europeo en la Propuesta, dando lugar a un mejor diseño final del euro digital una vez que el Reglamento entre en vigor. Un análisis sistemático como el descrito podría permitir el estudio de cada detalle del euro digital, generando información relevante para que las autoridades de la Unión Europea mejoren el contenido actual de la Propuesta considerando mejoras y alternativas que vayan más allá de las sugerencias menores descritas en este estudio.

Análisis del resto de proyectos de CBDC en curso en todo el mundo. De forma similar, el análisis de otros proyectos de CBDC actualmente en estudio en todo el mundo también podría reportar beneficios similares para el euro digital. Según el rastreador de CBDC y el Banco de Pagos Internacionales (BPI) , existen actualmente más de 40 proyectos de CBDC ya en fase piloto, y más de 80 autoridades monetarias de todo el mundo están

considerando la emisión de una CBDC. Un análisis integrador de todos ellos, centrado en las implicaciones jurídicas desde una perspectiva general, podría arrojar importantes conclusiones que podrían mejorar la próxima implantación del euro digital, ya que estaría respaldado por la experiencia de todas las autoridades monetarias pertinentes y de los principales socios mundiales que participan en proyectos de CBDC.

Además de los efectos positivos que este análisis puede aportar a la academia jurídica que estudia la emisión de CBDCs en general, y el euro digital en particular, el diseño de estándares legales para la tecnología a implementar también podría agilizarse. En línea con trabajos como el de Sethaput et al. (2023), un análisis comparativo de las diferentes arquitecturas para un CBDC puede ser de ayuda para los legisladores a la hora de determinar la tecnología a utilizar, ya que podrían abordar de antemano las implicaciones legales de una determinada elección.

Análisis coste-beneficio de la emisión del euro digital. Aunque el concepto de señoreaje se ha abordado en el Capítulo 2 de la Tesis, su análisis se ha limitado a introducir el concepto, sin embargo, una investigación adicional sobre este tema podría mejorar la emisión del euro digital. Gracias a este concepto, se sabe que el coste de emisión de una moneda puede calcularse técnicamente. Del mismo modo, también pueden determinarse los costes teóricos asociados a la emisión del euro digital, es decir, los costes asociados a la emisión, al mantenimiento de la infraestructura de liquidación, así como otros costes indirectos que puedan derivarse del texto legal que promulga su emisión. Se puede realizar un análisis económico directo para determinar la utilidad derivada de su implantación. Esto no sólo permitiría una estimación adecuada de los costes utilizables por las autoridades de la Unión Europea, sino que también permitiría al legislador europeo conocer adecuadamente el nivel de utilidad asociado a cada una de las funcionalidades del euro digital desde una perspectiva microeconómica, permitiendo la posibilidad de centrarse en las características que son relevantes para los futuros usuarios del euro digital, y redirigiendo la mínima cantidad de recursos al resto que, a pesar de ser necesarias por diversas implicaciones legales, no son esenciales para la mayoría de los futuros interesados en el euro digital.

Desarrollo de un marco teórico adecuado para el concepto de dinero. El concepto de dinero ha sido abordado en el Capítulo 2 de la Tesis en un intento de reducir su existencia jurídica a tres características fundamentales que la academia jurídica ha

identificado como el núcleo esencial de lo que constituye el dinero. Sin embargo, en el mismo capítulo, este análisis autoconclusivo ha sido criticado porque descuida la naturaleza social inherente al dinero y la imposibilidad fáctica de abordar su existencia sin tener en cuenta otras áreas del conocimiento, a saber, la economía, la política y la sociología. En consecuencia, el análisis de la consideración jurídica del euro digital como dinero, si bien no es incorrecto, sólo permite extraer conclusiones discutibles: el euro digital es dinero porque un acto legislativo, debidamente promulgado, le concede curso legal.

La crítica incluida en el Capítulo 2 de la Tesis pretende iniciar el debate entre la academia jurídica para el desarrollo de un enfoque multidisciplinar que permita explicar mejor qué hace que un determinado bien sea considerado dinero, más allá del enfoque jurídico clásico basado en las tres funciones del dinero. Tal y como se propone, el enfoque holístico que permite la teoría de sistemas parece un punto de partida adecuado, ya que ha sido capaz de actuar como marco teórico para disciplinas en las que los sistemas complejos son la norma. Analizar el concepto de dinero bajo este marco teórico es en sí mismo una línea de investigación de gran alcance, que, a pesar de su enorme importancia, requiere un nivel de estudio y atención superior al que es posible en un trabajo como el presente, destinado al análisis jurídico de una Propuesta de Reglamento de la Unión Europea.

Análisis en profundidad de los escenarios relativos a la Propuesta sobre el curso legal de los billetes y monedas en euros. El capítulo 2 de la Tesis aborda varias aparentes contradicciones que pueden aparecer en relación con el curso legal tanto del euro digital como de los billetes y monedas en euros. Debería realizarse un análisis en profundidad de la aparente contradicción para apoyar la tarea del regulador europeo a la hora de diseñar las implicaciones del curso legal tanto del euro físico como del digital, así como su esperada interacción. A pesar de lo señalado en la Tesis, lanzando prevenciones al legislador europeo, la complejidad de este tema recomienda estudiar las consecuencias jurídicas de las actuales consideraciones sobre el curso legal para asegurar una fluida interacción entre ambas manifestaciones, física y digital, de la moneda única.

Análisis de los pagos entre divisas en el Capítulo 4 de la Tesis. Este tema requiere un análisis más profundo que el presentado en esta Tesis, ya que requiere un análisis tanto técnico como jurídico del estado actual tanto de los estándares tecnológicos implicados

como del marco jurídico aplicable. Si bien no era el momento de realizar dicho análisis, ya que el foco de este trabajo debe ser la Propuesta y lo que conlleva la implantación del euro digital, la disposición de un marco jurídico adecuado para la probable implantación de los pagos multidivisa en la infraestructura de liquidación del euro digital una vez emitido recomienda hacerlo. Una futura línea de investigación sobre este tema puede avanzar en esta dirección, apoyando directamente las tareas de las autoridades de la Unión Europea, especialmente del Banco Central Europeo, en la determinación del diseño legal adecuado de dicha implementación.

Determinación de límites de tenencia uniformes dentro de la zona euro y entre los Estados miembros cuya moneda no es el euro. La Propuesta ha determinado que los límites de tenencia de euros digitales sean uniformes entre los Estados miembros cuya moneda es el euro, así como entre los Estados miembros cuya moneda no es el euro, en caso de que en el futuro se autorice la distribución del euro digital en dichos Estados miembros. Si bien este tema ha sido introducido en la Tesis, podría beneficiarse de un análisis empírico utilizando datos macroeconómicos y considerando la propensión de cada Estado miembro a utilizar el euro digital como medio de pago, así como las cuestiones específicas relativas al blanqueo de capitales y a la financiación del terrorismo a las que puede enfrentarse un determinado Estado miembro, ya que no son homogéneos. Esta línea de investigación recomienda realizar un análisis económico para definir efectivamente un límite de tenencia óptimo para cada Estado miembro, sujeto a cambios teniendo en cuenta los objetivos de adopción establecidos por las autoridades de la Unión Europea y otras preocupaciones como las medidas de lucha contra el blanqueo de capitales y la financiación del terrorismo. Dado que este límite de tenencia específico para cada Estado miembro sería contrario a las disposiciones actualmente existentes en la Propuesta, es necesario un análisis adecuado que demuestre su aplicación recomendada para sostener el cambio legal cuando se justifique ante el legislador europeo.

Inclusión financiera y digital. Si bien este tema ha sido ampliamente abordado en los Capítulos 4 y 5 de la Tesis, el análisis proporcionado no es suficiente para ofrecer adecuadamente una alternativa bien formulada a los términos actualmente incluidos en la Propuesta. En la medida en que la crítica planteada en dichos capítulos está correctamente formulada, se debería haber incorporado una inclusión de lege ferenda en cada subapartado para determinar explícitamente cómo debería abordar la Prop-

uesta la cuestión sobre la inclusión financiera y digital. En particular, varios aspectos directamente vinculados a la inclusión financiera y digital podrían beneficiarse de una exploración adicional, permitiendo futuras líneas de investigación como las que se describen a continuación.

Así, teniendo en cuenta los objetivos de inclusión financiera de la población infrabancarizada, potenciales beneficios derivados de la emisión del euro digital han sido obviados en la Propuesta. Sólo se han incluido referencias genéricas a lo largo del texto, sin referenciar medidas concretas para mejorar el acceso de ese sector de la población a los servicios de intermediación financiera, máxime cuando el legislador europeo ha explicitado que el euro digital no es equivalente a una cuenta bancaria pública, a pesar de sus similitudes. Dado que los beneficios asociados a la implantación del euro digital para la población infrabancarizada ya habían sido abordados por las autoridades de la Unión Europea, un análisis en profundidad del diseño óptimo para el próximo Reglamento sobre su emisión podría incluir medidas concretas para alcanzar dicho objetivo. Dichas medidas podrían incluir la implicación del sector público en la intermediación financiera a la hora de acceder a los servicios del euro digital o la implementación de una versión mejorada de la puntuación crediticia para asegurar el acceso de este sector de la población a una mejor financiación.

Por su parte, considerando los objetivos de inclusión digital de ciertos sectores de la población que tienen dificultades con la tecnología o no pueden acceder a ella, la Propuesta no aborda el tema en consecuencia, ya que no ofrece un plan de acción concreto. Hasta la fecha no se ha publicado ninguna documentación oficial relativa a esta cuestión, a pesar de su reconocimiento explícito en su artículo 22. Sólo se encuentran en el texto referencias mínimas a lo que hay que hacer para garantizar un acceso adecuado al euro digital a las personas necesitadas de asistencia, e incluso éstas son mejorables. Además, la Propuesta se basa excesivamente en los dispositivos móviles para acceder y utilizar el euro digital, y no se han incluido alternativas analógicas en , lo que aumenta el riesgo de exclusión y de ejecución de pagos no autorizados para los futuros usuarios del euro digital no expertos en tecnología. Debe desarrollarse una línea de investigación centrada íntegramente en el diseño de las consideraciones jurídicas que garanticen una adecuada accesibilidad de estos usuarios al euro digital, en línea con algunas de las ideas originales que se han incluido en esta Tesis.

Además de lo expuesto en el párrafo anterior, la imposición de un estándar tecnológico determinado, como hace la Propuesta en el artículo 22 para los Billeteros Digitales de Identidad Europeos, podría beneficiarse de un apoyo adicional por parte de la academia jurídica. Si bien su inclusión ya ha sido criticada en esta Tesis, una línea de investigación centrada en la determinación del estándar adecuado podría mejorar la Propuesta. A pesar de las consideraciones del Banco Central Europeo sobre el tema, la designación de estándares tecnológicos, en línea con el contenido del Acta Europea de Accesibilidad, seguramente se beneficiaría de una investigación adicional en esta dirección.

Análisis sobre el nivel óptimo de anonimización de las operaciones digitales de pago en euros. Como se analiza en el capítulo 6 de la Tesis, el legislador europeo ha diseñado las operaciones digitales de pago en euros de modo que ofrezcan un nivel de privacidad diferente según que la operación se considere en línea o fuera de línea, no ajustándose en ningún caso a las peticiones de los posibles usuarios de euros digitales. Si bien las disposiciones de la Propuesta parecen ajustarse a los requisitos de las medidas de lucha contra el blanqueo de capitales y la financiación del terrorismo promulgadas en la Unión Europea, aún pueden mejorarse para minimizar los comportamientos deshonestos de un sector concreto de los posibles usuarios del euro digital. En la Tesis se ha propuesto un enfoque alternativo a la anonimización de las operaciones de pago digitales en euros, tanto en línea como fuera de línea. Sin embargo, puede realizarse un análisis en profundidad de esta alternativa para diseñar un nivel óptimo de privacidad, animando a otros investigadores a contribuir en esta dirección.

Podría desarrollarse una línea de investigación en esta dirección. En primer lugar, podría realizarse un análisis teórico del continuo que va desde la "no supervisión" a la "supervisión completa" de las operaciones de pago digitales en euros, para determinar los riesgos asociados en cada punto del espectro considerado, incluyendo en el análisis todas las disposiciones legales pertinentes promulgadas en la Unión Europea. Esto permitiría analizar los beneficios potenciales de las consideraciones alternativas de la Propuesta. En segundo lugar, el análisis también podría incluir enfoques alternativos seguidos por otros Estados que estén aplicando actualmente un proyecto de CBDC, ya que la privacidad puede mejorarse atendiendo a varias características diferentes de una arquitectura de CBDC. En tercer lugar, la implicación de otras áreas de conocimiento en el análisis, como las ciencias informáticas, contribuiría a desarrollar un estándar tecnológico que

satisfaga tanto los requisitos legales como las posibilidades dentro del estado del arte de las medidas en materia de tecnología de pagos digitales.

El citado análisis se ha incluido como limitación de la Tesis debido a las dificultades que rodean al análisis de la documentación técnica sobre el euro digital. Aunque la documentación técnica sobre el euro digital suele estar disponible, no suele estar destinada al público en general, sino a los socios de aplicación de las autoridades de la Unión Europea. Esto reduce la posibilidad de ampliar el análisis desde una perspectiva científica, ya que la mayoría de las veces sólo los colaboradores preseleccionados pueden acceder a dicha documentación. En consecuencia, el desarrollo de ideas en el ámbito tecnológico se ve impactado, como es el caso de esta Tesis, por lo que se anima a una futura línea de investigación sobre el tema, con un enfoque multidisciplinar.

Análisis de la falsificación de operaciones de pago en euros digitales fuera de línea. Como ya se ha señalado en el capítulo 6 de la Tesis, las implicaciones técnicas relativas a la prevención de la producción de euros digitales falsos no se abordan en ningún momento en la Propuesta, a pesar de tratarse explícitamente en el punto 3 del anexo IV de la misma. Para el legislador europeo, las operaciones de pago en euros digitales fuera de línea podrían ser explotadas para duplicar fondos si no se aplican medidas de seguridad adecuadas. Sin embargo, la falta de actuación de las autoridades de la Unión Europea en este sentido recomienda estudiar el estado del arte de la tecnología implicada en las transacciones, centrándose en los dispositivos móviles utilizados para permitir los pagos digitales en euros offline, para analizar si es posible, cómo evitarlo e incluir sanciones específicas para desincentivar este tipo de conductas deshonestas.

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